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With Which Is Combined

Vol. XCIII, No. 17 PULP PAPER Thursday, October 22, 1931

To Install Largest Book Machine at Canton

Champion Fibre Co. Lets Contract to Pusey & Jones Corp. for 242-inch Fourdrinier, Capable of Operating at 1000 Feet Per Minute and Producing 150 Tons Daily—This, It Is Said, Will Be the Largest Book Paper Making Machine in the World, Costing Between $450,000 and $500,000—Machine To Be Ready April 1

[FROM OUR REGULAR CORRESPONDENT]

WILMINGTON, Del., October 19, 1931.—Announcement was made last week by the Pusey & Jones Corporation that it had closed a contract with the Champion Fibre Company, of Canton, N. C., to build the largest book paper making machine ever built, at a cost understood to be between $450,000 and $500,000.

Widest, Largest and Fastest Book Machine

The machine will be the widest, largest, and fastest of its kind in the world. It will be 242 inches in width, operate up to 1,000 feet per minute and will produce up to 150 tons per day. The total shipping weight will be about 1,500 tons. Officials would not disclose the contract price.

To Be Completed April 1

The contract will enable the company to call back a considerable portion of its employees and will occupy the time of about 300 men from November 1 to April 1. This work in connection with other recently secured for the joiner department will provide employment for more than 450 men during the Winter months.

Work Secured on Low Basis

It was explained that the work was secured on a low basis with the prompting motive being at values in line with the present industrial situation. Plans are being worked out to distribute the work over two shifts of six hours each, so that the money will go to a greater number of people. Preference will be given to old employees.

Gets Contract on Its Record

The company was awarded this contract because of the fine quality work produced by the Pusey & Jones Corporation and because of its performance in the past in the construction of large capacity and high speed paper making machinery. It is understood that the fine quality work of Pusey & Jones was the actual determining factor in the contract being secured by the local concern.

Equipment To Cost $1,500,000

The action of the Champion Fibre Company was taken following the announcement of President Hoover recently and their faith in the future has been the cause of much commendation for them because the construction of the new plant and equipment will cost about $1,500,000.

Advisory Committee Meets at Madison

[FROM OUR REGULAR CORRESPONDENT]

MADISON, Wis., October 19.—With the objective of a systematic and sustained attack on national and regional problems of the pulp and paper industry, the newly formed advisory committee to the U. S. Forest Products Laboratory held its first meeting at the Laboratory here Thursday and Friday, October 15 and 16.

Those in attendance were Rex W. Hovey, Oxford Paper Company, Rumford, Me., chairman; A. Bankus, Crown-Zellerbach Corporation, San Francisco; David L. Luke, Jr., West Virginia Pulp and Paper Company, New York; Allen Abrams, Marathon Paper Mills, Rothschild, Wis.; George S. Holmes, Brown Paper Mills Company, Monroe, La.; Carlile P. Winslow, director, Forest Products Laboratory; C. E. Curran, in charge of paper and pulp investigations, and other members of the Laboratory staff.

The committee was organized by Mr. Hovey, representing the Central Research Committee of the American Paper and Pulp Association, to assist in securing broader and more immediate contacts between research work of the Forest Products Laboratory and operating practice in the industry. As formed, the committee represents the regional distribution of American pulp and paper mills in practical entirety.

The two-day session was given over largely to consideration of the Laboratory's program of work as now organized, with special attention to pulping studies of southern, western, and Lake States woods, research on standard and new processes of cooking, and investigations on fiber properties and processing. The broader industrial contacts afforded through the functioning of the new committee will materially aid the planning of Laboratory projects and the practical adaptation of research findings, according to views expressed by Mr. Hovey, Director Winslow, and others who attended the meeting.

DePere Paper Mfg. Co. May Rebuild Mill Shortly

Owners of Property Destroyed by Fire Several Months Ago Request City Council for Tax Concessions—If Granted Construction of New Plant Will Probably Start At Once—Approximately $50,000 Will Be Spent on New Plant

[FROM OUR REGULAR CORRESPONDENT]

APPLETON, Wis., October 19, 1931.—Plans are being formulated by the DePere Paper Manufacturing Company, DePere, Wis., to rebuild its mill, destroyed several months ago by fire. The owners, Morris and Herman Miller, have approached the city council of DePere on a proposal to tax them only on the real estate for the next five years and not the improvements. By this means, they point out, considerable financial assistance will be given in re-establishing the plant. The council has the matter under advisement and has voiced no opposition.

If this question is settled favorably, the mill probably will be rebuilt at once as a means of restoring employment to the men thrown out of work by the fire. Approximately $50,000 will be spent on the building.

Land Damage Suits Lost

The fight of paper and power companies to eliminate one step in litigation involving land damage suits caused by backwaters from power dams was lost for the second time in the Supreme Court at Madison, Wis., recently. The court upheld its previous ruling in the case of the Marinette and Menominee Paper Company and the Union Falls Power Company that lower court appointments of commissioners to estimate damage to such land are not appealable. These two companies were sued by Mr. and Mrs. Theodore Manns, owners of farm land on the Menominee River about a mile above the paper company's Park dam. The complainants contended backwaters damaged their property so far as agricultural purposes were concerned. The companies appealed from a decision of the lower courts granting damages, because a precedent was set which may be costly to all water power owners.

Menasha Control Dam Level Dispute

Court action faces paper mill and water power owners if the Fox River control dam at Menasha, Wis., is restored to a level of 21¼ inches above the crest. The mills have sought consent of the Government to return to this level so as to keep a greater storage of water in Lake Winnebago to overcome drought and sanitation difficulties. The Association for the Relief of High Water has announced through its president, Allan H. Tripp, that if the change is granted, the association will appeal to the courts to remove the flush boards. No decision has been announced by the U. S. Engineering Department as the result of hearings.

Allan Abrams Addresses Rotary Club

Allan Abrams, technical director of the Marathon Paper Mills Company, Rothschild, Wis., spoke last week before the Rotary Club at Menasha, Wis., concerning the effect of progress in the scientific world. He told how paper is replacing metal, and how metal is replacing wood. This he attributed to a connection between science and invention that has brought a well founded recognition of the value of these two angles in the progress of the world.

Safety Lectures to Be Resumed

Safety lectures will be resumed at Wisconsin Rapids, Wis., this Fall under auspices of the vocational school there. J. J. Plzak, safety director of the Consolidated Water Power and Paper Company, is in charge. The speakers engaged and their subjects are: "Keeping Ahead of the Headlines," Frederick Snyder, New York; "Help Make Our Country Safe," L. A. Crittenton, Chicago; "Why Preach Safety?" William D. Hales, Maryland Casualty Company, Baltimore, Md.; "Prevention Is Worth Its Cost," W. E. Darling, Cincinnati, Ohio; "Traffic," F. M. Kreml, department of police, Evanston, Ill. The sessions will be held weekly starting October 30.

TAPPI Lake States Section Meets

Nearly one hundred members of the Lake States Section of the Technical Association of the Pulp and Paper Industry attended a dinner and business meeting on Tuesday of last week at Conway Hotel Appleton, Wis. An interesting address on "Chrome and Chrome Nickel Alloys," was given by Griswolt VanDyke, of Joseph T. Ryerson & Son, Inc., Chicago. He told of the many new uses of the metal, its resisting qualities against chemicals and corrosion, and places where it may best be put to use in paper mill equipment. An extended discussion followed his talk.

News of the Industry

Permission has been granted the Marathon Paper Mills Company to construct a new storage and shipping warehouse and side track by the Wisconsin Public Service Commission. The building is being erected at the carton division at Menasha, Wis., but it was necessary to secure special permission because the location of the building would not permit adherence to the state clearance statutes.

L. E. Smith, mill manager, has been elected a member of the board of directors of the Nekoosa-Edwards Paper Company, Nekoosa, Wis. He was chosen by the board to fill the vacancy caused by the death of F. J. Wood, Wisconsin Rapids banker.

Fifty trusties from the Wisconsin penitentiary at Waupun will start work soon as a reforestation project in Douglas County. A camp will be built in the cutover section, and the men will start planting trees soon. A similar camp was established near Rhinelander, Wis., recently, and 53 prisoners employed there have planted 300,000 trees.

A team of horses used in hauling refuse away from the Flambeau Paper Companys' mill at Park Falls, Wis., figured in a runaway recently which ended up in the pulpwood canal. The horses came near drowning and were saved only by holding their heads above water until they could be cut loose from a wagon and hauled to safety with ropes.

Federal Charter Granted

A federal charter has been granted to Consolidated Paper Corporation, which is taking over the undertakings and assets of Canada Power and Paper Corporation, Anticosti Corporation, Belgo-Canadian Paper Company, Wayagamack Pulp and Paper Company, St. Maurice Valley Corporation and the Laurentide Company. The new company has an authorized capital stock of 2,000,000 shares of no par value and is authorized to borrow up to $80,000,000.

Canadian News Print Mills Expand Production

Operation Ratio for September was 57.7 Per Cent, Compared With New Low of 51.3 Per Cent In August—Output of News Print Paper Totalled 178,412 Tons Compared With 195,490 Tons In Corresponding Period of Preceding Year.

[FROM OUR REGULAR CORRESPONDENT]

MONTREAL, QUE., October 19, 1931.—News print statistics for September show an improvement in output by Canadian mills, when compared with the previous month, the operating ration being 57.7 per cent capacity, as compared with the new low of 51.3 per cent in August. Production amounted to 178,412 tons, as compared with 195,490 tons in September last year. For the nine-month period of this year ended with September, output of news print by Canadian mills amounted to 1,670,150 tons, as compared with 1,902,056 tons in the corresponding nine-month period of last year on a decrease of 12 per cent.

Lord Rothermere's Visit

Lord Rothermere, the head of the *Daily Mail* newspaper interests in Great Britain, has just concluded a brief visit to Montreal and sailed for home. He came here primarily in connection with the affairs of the Anglo-Canadian Paper Company, of which he is also the head. This company, which was formerly included in the Canada Power and Paper Corporation, has reverted to its former independent status, and it was to straighten out matters in connection with the change that Lord Rothermere came here. In an interview he said the company was doing as well as any of the mills in Canada, "although that does not mean to say that any news print concern is paying 100 per cent dividend." He expects to visit Canada again before the end of the year, when part of his business will be to inspect some property in British Columbia in which he is interested.

Exchange Rate and B. C. Paper Trade

From Vancouver it is announced that the exchange situation will not affect the business of British Columbia paper mills. In some quarters it was reported that the depreciation of the Canadian dollar would result in the placement of larger orders for news print to take advantage of the prevailing prices, but this is not so. United States purchasers of paper pay in United States funds and the fact that Canadian mills pay for their equipment, bond interest and so forth in American funds virtually offsets the difference.

Meanwhile, Coast paper mills report the market situation to be rather better than anticipated and export orders have been received from countries which previously have not been placing much business with Canada.

According to the Vancouver Merchants Exchange, production of paper and pulp in British Columbia is having a favorable influence, on the port of Vancouver. News print paper manufacture in British Columbia commenced in 1913 with an output of 46,000 tons which by 1930 had increased to 225,000 tons, principally exported to the United States, South America and Australia.

The production of wood pulp exceeds the local demand and a considerable quantity is exported, principally to Japan, United Kingdom and United States.

There are eight mills in British Columbia manufacturing pulp and paper, of which five are presently operating. The combined capacity of the mills is 1,015 tons a day of paper, and 440 tons a day of pulp.

Export shipments of pulp and paper from British Columbia ports during 1930 totalled over 275,000 tons compared with a total of 250,000 tons in 1929.

Canada Power Deposits Close

At a meeting of the Securities Protective Committee of the Canada Power and Paper Corporation, held here during the week, it was reported that deposit of securities of the companies grouped under Canada Power and Paper Corporation in connection with the reorganization of the company as the Consolidated Paper Corporation, Ltd., reached the final date fixed under the agreement, October 10, with 94.74 per cent of the bonds placed in the hands of the Securities Protective Committee; 95.65 per cent of the debentures; 93.18 per cent of the preferred shares, and 91.08 per cent of the common shares outstanding.

As the final date for deposit of securities has now passed, holders who have remained aloof will have to make special arrangements or await the complete reorganization of the new company. Special arrangements, however, can be made with the Hon. Gordon W. Scott, secretary of the committee whose office is with P. S. Ross & Sons, in the Royal Bank Building.

All is in readiness now for the final meetings of the constituent companies and their various classes of shareholders, at which, final and formal approval will be given to the plan which brings into operation the new company, Consolidated Paper Corporation, Limited, headed by L. J. Belnap.

Ships Pulpwood to United States

The Oxford Paper Company which has timber land leases on Cape Breton Island, has shipped a cargo comprising 1,600 cords of pulpwood from the Bras d'Or Lakes to Portland, Me. The same interests have loaded seven full steamship cargoes from Cape Breton to Portland for their two Maine pulp mills. The Oxford Paper Company controls the Nashwaak Pulp and Paper Company, whose plant near Saint John has been closed for some time.

Heads Michigan Superintendents

[FROM OUR REGULAR CORRESPONDENT]

KALAMAZOO, Mich., October 19, 1931.—Walter Crawford, of the Sutherland Paper Company, was elected chairman of the Michigan division of the American Pulp and Paper Mill Superintendents Association, at the annual election, held Thursday evening at the Columbia hotel. Other officers named are: First vice president, John Weimer, of the Lee Paper Company; second vice president, James Wise, of the Kalamazoo Paper Company; secretary-treasurer, George Pountain, of the Bryant Paper Company. The latter has been secretary of the Michigan division almost since its organization.

Joseph L. Hooper, Battle Creek, United States Representative from the Third Michigan district, was the speaker. Dinner preceded the program.

Pennsylvania-New Jersey Superintendents Meet

Fall Convention Held At Benjamin Franklin Hotel, Philadelphia, Attracts Approximately One Hundred Enthusiastic Members—Many Interesting and Instructive Addresses Rendered —Charles Kephart Elected Chairman for Coming Year

[FROM OUR REGULAR CORRESPONDENT]

PHILADELPHIA, Pa., October 19, 1931—With its well planned program of diversified and entertaining features the Fall Convention of the Pennsylvania-New Jersey Division of The American Pulp and Paper Mill Superintendents' Association, brought together 105 members whose enthusiasm was held until the closing of the day's activities in the sociability of the banquet board, near the mid-night hour. There was little evidence of the depression in the cheerfulness of spirit of the group as they expounded problems of the paper making industry from the mill workers' angle, and disclosed sentiments and exchanged ideas for the firmer establishment of business and the development of better papers to meet the needs of the present situation and to bring about perfection of manufacturing in the hopefulness of a bigger and sounder paper market in the not distant future. The evening's gathering at the dining table in the Crystal Ball Room was graced by the presence of the fair sex and made an occasion of jollification and camaraderie in the witticisms of the Master of Ceremonies, William Hendrie Lloyd, of Curtis & Bros., and in the happy recollections of former National President, James Garfield Ramsey, of the Jessup and Moore Co., the guest of honor, who presided in the absence of the present president, Roy Kelley, of Wausau, who was unable to attend.

Secretary Linville Mullin Honored

Mr. Ramsey, on behalf of the local division, presented Secretary J. Linville Mullin, of the Pennsylvania-New Jersey Division, and of Jessup and Moore, with a complete golf outfit, expressing the esteem of his fellows in the memento and their appreciation of his services. Then the diners were entertained by a high class musical program of popular and classical selections and chorals introducing novel effects by the guests, as directed by V. L. Sanderson, song leader, of the Terry Steam Turbine Company, Philadelphia, and by the impromptu solos and dancing of his charming daughter, Miss Betty Sanderson, combined with professional talent. Mr. Ramsey displayed talent as a singer of Irish ballads. Manly P. Northam, Ph. D., industrial and human engineering counselor linked with the National Vulcanized Fibre Company, Yorklyn, Del., proposed his constructive philosophy in humorous and practical messages as remedy for the ills of business and for the building of better efficiency in personnel.

E. C. Gildenzopf, chairman of the division, presided at the business sessions throughout the day and opening his meetings with a word of greeting, introduced the first speaker, Fred F. Kaufman, consulting engineer, 3334 Market street, Philadelphia, whose treatise on economies in steam generation for small mills brought out many valuable pointers for saving in power and mechanical equipment.

He was followed by J. W. Corey, of the Reliance Engineering Company, Cleveland, whose simple methods of controlling speed in winders and calenders by means of rheostats, anti-friction bearings, electric drives on shafts and perfecting rolls under such controlling devices were given, and whose talk was followed by experiences of the superintendents in their own contact and use of method disclosed.

"Dandy Rolls and Wires" was the topic of Roger G. Edwards, of the Cheney-Bigelow Wire Works, Springfield, Mass., and revolving around the Fourdrinier wires he gave the evolution of wires from brass to phospher bronze and the combination of the latter to the present type with stainless steel, which his firm had under patent of April 14, 1931. He gave comparative duration of wear of the Duo-Wear wires in mills, some of the records on various weights of papers being an increase from 25 to 41 days, 46 to 54 days, 26 to 48 days and then told of the value of the Dandy Roll as an efficient and economical factor in mill operation.

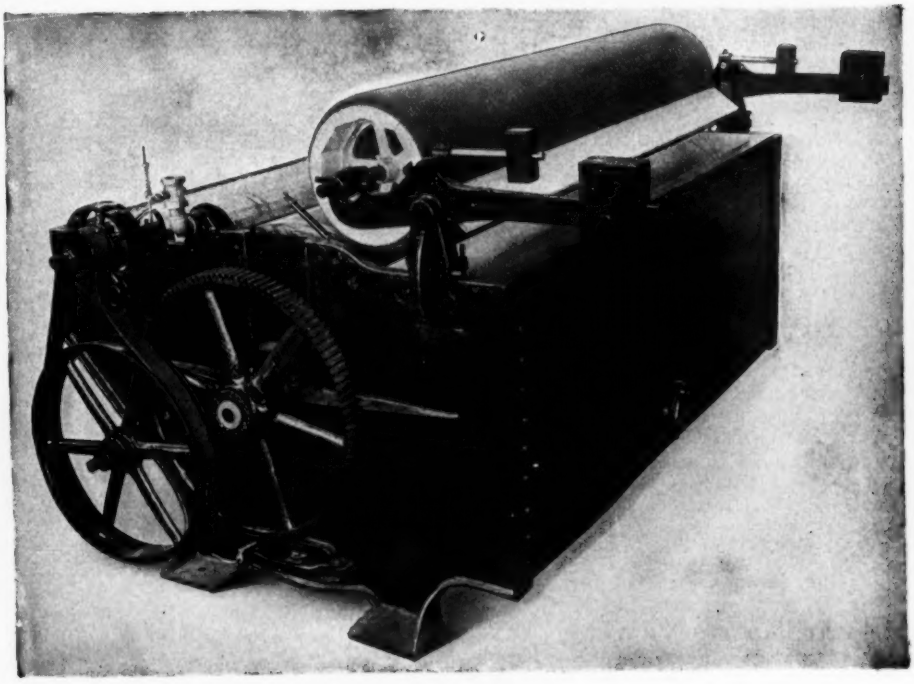
Joseph H. Wallace, of the Black-Clawson Company, Hamilton, Ohio, chronicler of trade annals and compiler of "Reminiscences of an Old-timer," distributed in booklet form at the luncheon, made his talk on "Modernizing" a happy memory to the trade.

Printers difficulties with paper and adaptability of papers to inks, presses and other equipment and factors of papers in relationship to the allied trades gave Arthur B. Haise, of Innes & Son, Philadelphia, material for an educational theme for the superintendents. He told of coated papers, laid antique, and temperature changes incident to exchange of warehousing of papers in the mills, distributors and among printers, and how it worked on printing, stressing needs for good pulp, more pliable papers, and less harshness in texture in order to promote good imprint, and prevent offset.

He told of difficulties in making folds in laid antique, lack of beating in pulps which made it hard to print between the laid marks and chain marks, poor color work resulting from climatic changes in storing and making papers, and urged the mills to consider warehousing conditions in order to properly preserve papers and their adaptation for color work. He stressed the importance of uniform sheets, non-curling edges, needs of co-operation of ink manufacturers with paper mills in order to obtain better printing effects and absorption of inks, elimination of hard calendering, profuse sizing which detracts from ink absorption qualities, the study of offset problems and carefulness in preventing dust formations in papers, more care in ream count to prevent "short reams," prevention of capacity through proper pulp ingredients and other factors.

Question Box Conducted

Mr. Ramsay conducted the "Question Box" on the following topics: (1) What is the proper distance between the slices of a machine running approximately 75 feet to 150 feet per minute, also on a machine running at greater rates of speed? (2) Is any pitch required on a Fourdrinier machine up to 400 feet per minute and how much? (3) Can you get as good drainage from driers with the siphon pipe discharging into a discharge header on a level with the bottom of the driers, as when the discharge header is some distance below the bottom of the drier level? The discharge header in both instances connected with a vacuum of approximately 5 inches. (4) How Can Waviness in dry finish boards be eliminated? (5) How to obtain better flexibility in folding boards. (6) How to increase bulk in dry finish boards.



It pays

Working in a Bird Closed System, the Bird Save-All gives you 100% fibre recovery. You can't ask for more than that. Yet, of all the devices ever made for the purpose, the Bird Save-All is the simplest and the least expensive to install and operate. That's why it is so *profitable.*

May we submit layouts and estimates for your mill? Write.

BIRD MACHINE COMPANY
South Walpole :: Massachusetts

THE BIRD SAVE-ALL

Charles Ellis, of the Dowingtown Manufacturing Company, Downingtown, Pa., gave some helpful hints and advice to the superintendents on the last three questions, stating that the Extractor Rolls, made by his firm, have aided mills in increased bulk and test and told of the installation of five of these in as many mills of the Robert Gair Company for this particular purpose. He told of another paper mill which is now installing as high as three on a single machine and is getting bulk finish and test in satisfactory usage.

Election of Officers

Election of officers for the coming year announced at the noon hour by Chairman Gildenzopf, were as follows: Chairman, Charles Kephart, general superintendent of the York Haven Paper Company, York Haven, Pa.; first vice chairman, J. Linville Mullin, superintendent, Jessup and Moore Paper Company, Augustine Mill, Wilmington, Del.; second vice chairman, H. S. Shellington, superintendent, West Jersey Paper Company, Camden, N. J.; third vice chairman, S. M. Hesser, Hinde & Dauch Paper Company, Gloucester, N. J; and secretary and treasurer, Harry Busser, Electrical Engineer, York Haven Paper Company.

Chairman Gildenzopf thanked the following retiring officials for their cooperation during his term of office: E. C. Gildenzopf, Chairman, Continental Paper Company, Ridgefield Park, N. J.; Charles Kephart, First Vice-Chairman, York Haven Paper Company, York Haven, Pa.; Ralph Schaffer, Second Vice-Chairman, McAndrews & Forbes, Camden, N. J.; John W. Gregor, Third Vice-Chairman, Jessup & Moore Paper Company, Elkton, Md.; J. Linville Mullin, Secretary-Treasurer, Jessup & Moore Paper Company, Wilmington, Delaware.

He also extended to the following committees the appreciation of the members for the excellent dinner and program of the Convention: Committee of Arrangements—J. Bertwell White, Advisory Chairman; S. M. Hesser, Chairman; J. Carl Schmidt, J. Linville Mullin, Frank E. Winslow, V. L. Sanderson and J. C. Dieffenderfer. Reception Committee—John Bingham, Chairman; Ward Smith, Craig Maxwell, David Lindsay, 3rd, A. W. Wickham, H. S. Shellington and James W. McClenighan. Mrs. Joseph H. Dow was chairman of the Ladies Committee. Among those at the Convention were:

Among Those Present

C. B. Allen, Reliance Electric and Engineering Company, Philadelphia; J. W. Corey, Reliance Electric and Engineering Company, Cleveland; J. D. Skeer, F. C. Huyck & Sons, Albany; John C. Dieffenderfer, Paper Makers Chemical Company, Philadelphia; Jacob Edge, Downingtown Manufacturing Company, Downingtown, Pa.; E. N. Glauner, Downingtown Manufacturing Company, Downingtown, Pa.; Robt. A. Paugh, W. C. Hamilton Company, Miquon, Pa.; James G. Ramsey, Jessup & Moore, Wilmington; Frank E. Winslow, General Electric Company, Philadelphia; Geo. Zeiss, Manhattan Rubber Company, Philadelphia; G. W. Roberts, General Electric Company, Philadelphia; J. Francis, Container Corporation of America, Philadelphia; H. R. Spare, H. R. Spare Company, Philadelphia.

Anthony Masington, Masington & Company, Philadelphia; Ray Stearns, Container Corporation of America, Philadelphia; E. C. Gildenzopf, Continental Paper Company, Ridgefield Park, N. J.; F. H. Fielding, Diamond Mills Paper Company, Bloomfield, N. J.; J. Linville Mullin, Jessup & Moore Paper Company, Wilmington, Del.; H. S. Shellington, West Jersey Paper Manufacturing Company, Camden, N. J.; S. C. Wentz, P. H. Gladtfelter Company, Spring Grove, Pa.; A. Nyitray, Eastwood Corporation, Belleville, N. J.; R. G. Edwards, Cheney-Bigelow Wire Works, Springfield, Mass.; Joseph H. Dow, Castle & Overton, New York; Chas. Kephart, York Haven Paper Company, York Haven, Pa.; Harry C. Busser, York Haven Paper Company, York Haven, Pa.; Geo. Hardaker, Sinclair Company, Holyoke, Mass.; James Raines, Lindsay Wire Weaving Company, Cleveland, Ohio.

Alan R. Boyd, F. C. Huyck, Felts, Albany, N. Y.; A. G. Caldwell, Knox Woolen Company, Pittsfield, Mass.; David D. Piller, William Cablle Excelsior Wire Manufacturing Company, Brooklyn, N. Y.; Geo. B. Martin, General Dyestuffs, Philadelphia, H. F. Hoffman, General Dyestuffs, Philadelphia; Joseph H. Wallace, Black-Clawson Company, Hamilton, Ohio; Geo. Heidrick, Wallace & Tierman, Newark, N. J.; Harold J. Davison, The Paxall Company, Crawford, N. J.; William C. Law, 387 Hermitage street, Roxboro, Philadelphia; Hon. Geo. Bicleing, Washington, D. C.; John W. Gregor, Jessup & Moore Paper Company, Elkton, Md.; H. T. Lundquist, National Vulcanite Fibre Company, Yorklyn, Del.; J. F. Murray, National Vulcanite Fibre Company, Yorklyn, Del.; Calvin S. Meixwell, Bartlett Hayward Company, Baltimore, Md.

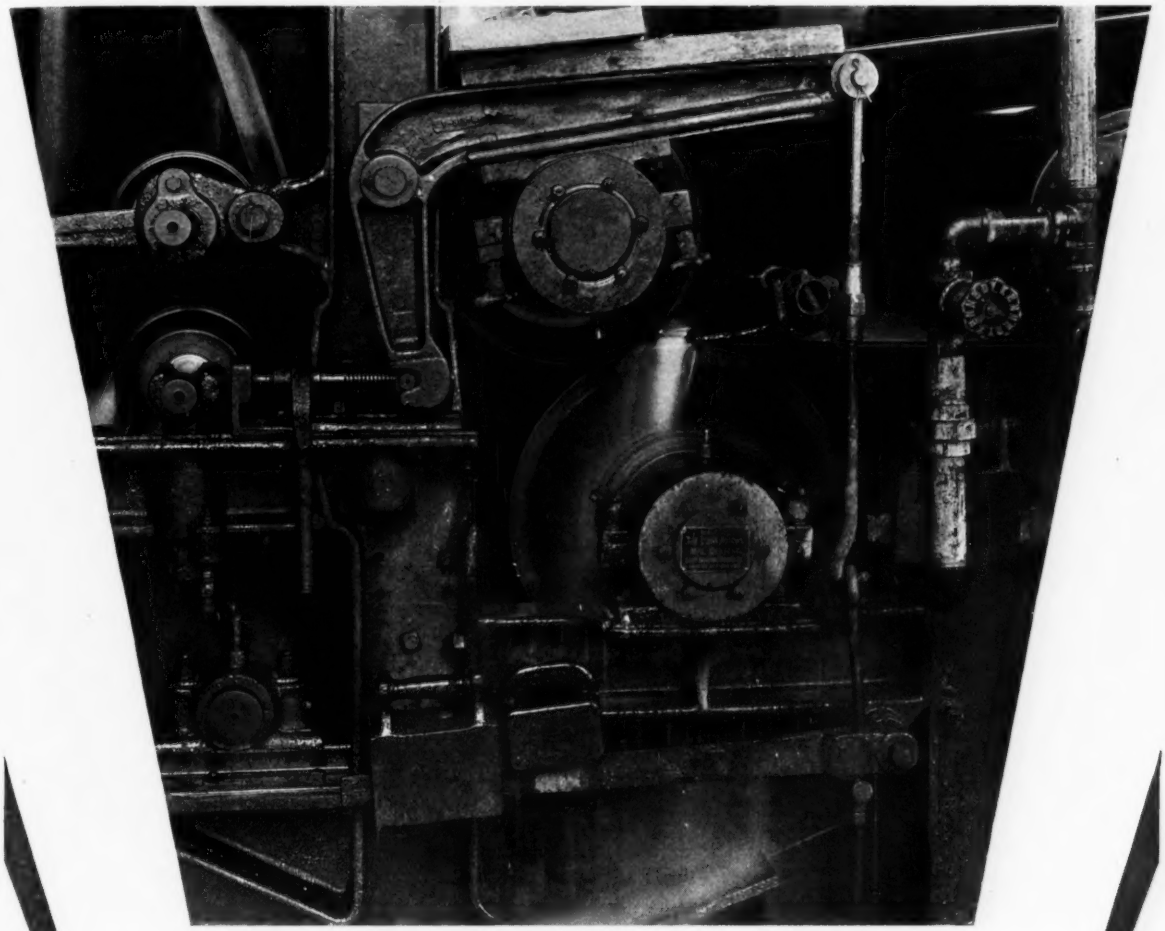
John Bingham, Dill & Collins, Philadelphia; John Roslund, Moore & White Company, Philadelphia; J. Bertwell White, National Vulcanite Fibre Company, Yorklyn, Del.; Joe Hodgins, the *Paper Mill;* Chas. Ellis, Downingtown Manufacturing Company, Downingtown, Pa.; J. J. Farrell, Downingtown Manufacturing Company, Downingtown, Pa.; J. I. Kelley, Moore & White Company, Philadelphia; L. M. Booth, Booth Chemical Company, Elizabeth, N. J.; T. J. Keenan, the *Paper Industry,* New York; Oscar Stamets, Riegel Paper Corporation, Riegelsville, N. J.; L. H. Bidwell, Riegel Paper Corporation, Riegelsville, N. J.; S. M. Hesser, Hinde & Dauch, Gloucester, N. J..; C. R. Lynch, Dill & Collins,, Philadelphia; Nathan Zane, Jr., Moore & White Company, Philadelphia.

W. S. Tredick, Trocco Lubricating Company, Philadelphia; Wm. Stevenson, Moore & White Company, Philadelphia; J. R. Kessler, Glassine Paper Company, Conshohocken; Chas. McDowell, McDowell Paper Mills, Philadelphia; Wm. Butler, Glassine Paper Company, Conshohocken; H. E. Hurd, Oakite Products Company, Philadelphia; J. J. Basch, Oakite Products Company, Philadelphia; Ward Smith, Mineralite Corporation, Philadelphia; Joseph Stuart, Lobdell Car Wheel Company, Wilmington; Manly P. Northam, National Vulcanite Fibre Company, Yorklyn, Del.; L. D. Post, the *Paper Mill,* New York.

Roy N. Underdown, American Dyewood Company, Philadelphia; E. J. Johnstone, Lockport Felt, New York; J. Carl Schmidt, Dupont, Wilmington, Del.; John Loomis, Heller & Merz, New York; Leo H. Detwiler, Heller & Merz, Philadelphia; T. H. Morrissey, Schuler & Benninghofer, Hamilton, Ohio; M. C. Maxwell, MacDowell Paper Company, Manayunk; V. Jacobsen, National Aniline and Chemical Company, Philadelphia; George Foreman, York, Pa.; V. L. Sanderson, Terry Steam Turbine Company, Philadelphia; H. M. Saffer, Stein, Hall & Co., Philadelphia; E. L. Stokes, Stein, Hall & Company, Philadelphia.

Mrs. J. Linville Mullin, Wilmington, Del.; Mrs. H. S. Shellington, Camden, N. J.; Mrs. James Raines, Philadelphia; Mrs. J. Bertwell White, Yorkland, Del.; Miss Emma E. Mellinger, Philadelphia; Mrs. Chas. Ellis, Downingtown; Mrs. M. P. Northam; Mrs. S. M. Hesser, Gloucester, N. J.; Mrs. L. D. Post, New York; Miss Gene Carr, the PAPER TRADE JOURNAL, Philadelphia; Mrs. J. G. Ramsey, Wilmington, Del.; Miss Betty Sanderson, Philadelphia; Mrs. C. S. Meixell, Baltimore; Mrs. Jos. H. Dow, Nutley, N. J., Mrs. George Foreman, York, Pa.

DOWNINGTOWN



EXTRACTOR ROLL

(PATENTS PENDING)

INCREASES BULK & STRENGTH OF SHEET

After the installation of a Downingtown Extractor Roll on a machine making 16 point test board, the weight of the sheet, per 1000 square feet per point of thickness, was reduced and the Mullen test increased. Another mill using sulphite screenings, for freeing up the furnish to eliminate crushing, found they could cut out 50% of the screenings and still produce the same grade of board.

The Extractor Roll removes as much as 2 to 3 lbs. of water per lb. of finished board. It eliminates picking, checking and blowing and produces a firmer sheet with a better finish. The economies of the Extractor Roll in power, steam, felts and increased speed make it a sound investment. We can prove this with facts.

The Downingtown Manufacturing Co., Downingtown, Pa.

Annual Safety Congress Meets In Chicago

Large Number of Mill Executives Attend Convention of Paper and Pulp Section, Held In Hotel Stevens—Many Interesting and Instructive Addresses Given by Recognized Authorities—Splendid Exhibition Attracts Attention

[FROM OUR REGULAR CORRESPONDENT]

CHICAGO, Ill., October 17, 1931—The Paper and Pulp Section played an important part in the Twentieth Annual Safety Congress and Exposition held at the Hotel Stevens, Chicago, October 12 to 16. A large number of mill executives were present not only to take part in the interesting program but also to inspect one of the largest and most instructive group of exhibits of safety appliances ever seen in the history of the exposition. Included in the list of those paper men present were A. S. Cook, Price Bros. & Co.; W. A. Gleason, Hammermill Paper Company; M. G. Hoyman, Kimberly-Clark Paper Company; W. H. Jennings, Bogalusa Paper Company; Arthur Murray, Container Corporation of America; G. W. Phillips, Champion Fibre Company; H. G. Gilson, Oxford Paper Company; J. J. Plzak, Consolidated Water Power and Paper Company; R. S. Hiney, Container Corporation of America; H. D. Banta, Hoberg Paper and Fibre Company; G. T. Adams, International Paper Company; R. H. Scanlon, regional director for the Paper and Pulp Section, and a large group of Chicago and out of the city mill representatives.

Reduction of Accident Rate

The entire program was, of course, dedicated to a reduction of accident severity rate and that the Paper and Pulp Section had a mark to shoot at was evidenced by the fact that, in 1930, the reduction rate was 28 per cent, only three other industries achieving greater accident severity reductions. The paper and pulp group also reduced their fatality rate by 28 per cent in three years, as compared to a reduction of 5 per cent for all industries. Some 230 establishments reported their accident experience to the National Safety Council including representatives from envelope and other paper goods lines; paper box and container makers and paper and pulp mills.

The program of the Paper and Pulp Section got under way on October 13 with W. J. Brennan, general chairman, presiding, and giving a resume of the year's activities. E. E. Grant, the first speaker, reviewed the trend of accidents in the paper and pulp industry and J. J. Plzak talked on "Why Safety Must be a Part of our Daily Tasks." "Safety on the Paper Machine" was discussed by Allan Hyer of the Black-Clawson Company.

The feature address on Tuesday afternoon, October 13, was given by R. S. Hiney of the Ogden Division of the Container Corporation on "Hazards Peculiar to the Box Board Industry and Their Elimination." Following this a "question box" served to bring out a variety of topics concerning safety in the industry.

Paper and Pulp Day Observed

On Wednesday, when there was no general program, the Paper and Pulp Section observed "Paper and Pulp Day" by viewing the more than 100 exhibits of safety and accident prevention appliances. In group meetings throughout the day a continuation of the "question box" method of covering detailed consideration of important safety problems featured.

Thursday, the paper executives heard H. D. Banta, of the Hoberg Paper and Fibre Company, talk on "Electrical Hazards of the Pulp and Paper Industry." Mr. Banta listed the various electric equipment that needed special attention to prevent accidents and cited ways and means to insure this accident prevention. Overloading of circuits, he said, is a common fault of most paper mills—due primarily to failure to anticipate future requirements. He urged paper executives to "remove the hazards by proper attention—to replace motors carrying continuous overloads with motors of proper size, to adequately ground all non-current carrying parts of all electrical apparatus."

G. T. Adams, International Paper Company, discussed "Unusual Accidents and Their Remedies" suggesting that the best "remedies" were proper selection of employees, proper instruction of how to do the job and proper supervision of the job. He declared that efficient operation determines the degree of success, whether it be safety, production or any other objective of any plant program. Selection, he stated, had a great deal to do with the proper type of employees.

Unsafe Practices Discussed

On Thursday at noon, the section adjourned to private dining room 1 in the Stevens Hotel, enjoyed a luncheon and heard data on the contest and awarding of certificates, all presented by A. Scott Dowd, chairman of the Statistics Committee.

On Thursday afternoon M. G. Hoyman of the Kimberly-Clark Corporation, opened up an interesting avenue of discussion by talking about "The Difference Between Carelessness and Unsafe Practices." "The term 'carelessness' implies a lack of interest in safety, even to the extent of ignoring safety rules and safeguards," declared Mr. Hoyman. "My association with thousands of men has convinced me that men do not want to get hurt and that, given the proper training and supervision, they will get hurt infrequently."

Mr. Hoyman said that he had been campaigning for some time against unsafe practices brought about by habit, poor training, ignorance, reluctance to change or progress. It is his contention, as stated, that the substituting of safe habits for unsafe habits not only constitutes our present safety problem but is the explanation for the success of most big safety runs achieved in the past. Here Mr. Hoyman quoted from the record of the Remington-Rand Company.

Three avenues are open by which men may learn how to do the work assigned in a paper mill, said Mr. Hoyman. They are (1) by a course of training and instruction given by experienced operators, (2) by observation of others doing the same or similar work, and (3) by experimenting more or less with no help, until a certain degree of proficiency is acquired. The third method is the only one that the new man might be held accountable for if his method or practice is unsafe. Mr. Hoyman concluded his interesting talk by saying that "the conscientious endeavor of spirited men, moved by a sincere desire to eliminate preventable accidents, to reduce the suffering and increase the productivity of fellow human beings, will bring us all closer together in a fellowship of common interest; and unsafe practices will be placed on the shelf, where carelessness has been for quite some time. Then you will

Kraft And Soda Mill Executives Are Urged To Investigate The Advantages Of The

ROSS-WAGNER FURNACE

one of the outstanding achievements of the industry

A more efficient and economical method for recovering chemicals—a means of reducing steam cost by fully utilizing waste heat—a system that overcomes the nuisance of dirt, smoke and odor. The combination of proven advantages will, in most plants, completely justify replacement of existing equipment from a standpoint of operating economy as well as of improved quality and increased capacity of pulp production.

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HEATING—VENTILATING—DRYING

have achieved that most desirable status of "No Accidents This Year."

The broad extent of the safety movement was forcefully brought out by R. H. Scanlon, regional director for the Pacific Coast of the Paper and Pulp Section. Mr. Scanlon, talking about the organization of safety activities on the West Coast, cited many examples of splendid safety records made, called attention to programs adopted and convinced those present of the progressive efforts being made along the Pacific Coast in the interests of accident prevention.

Officers elected by the Paper and Pulp Section for the ensuing twelve months period included J. J. Plzak as general chairman; George Roller, of the Rhinelander Paper Company; and Arthur Murray, of the Container Corporation of America is vice chairman, and the election of H. D. Banta, of the Holberg Paper and Fibre Company, as secretary to succeed H. G. Gilson, of the Oxford Paper Company. Mr. Plzak, the new general chairman, is connected with the Consolidated Water Power and Paper Company.

Winners of Trophies and Certificates

Winners of the National Safety Council trophies and certificates awarded at the 1931 Congress for the Paper and Pulp Section by Scott Dowd included four groups in division A and one group in Division B. The winner in Division 1, Group A, was the Kimberly-Clark Corporation, Falls Mill, Niagara Falls, N. Y. The Champion Coated Paper Company, Mill 1, Hamilton, Ohio, won first award in group B; Consolidated Water Power and Paper Company, Appleton Division, Group C; International Paper Company, Riley Mill, Riley, Maine, Group D. In Division 2 the Bemis Brothers Bag Company, E. Pepperell, Mass., won first honors, with The Huntingdon Division of the Container Corporation of America ranking second.

The winner of Group B, Mill number 1 of the Champion Coated Paper Company, Hamilton, Ohio, was awarded the grand prize of *Paper Industry*, for the best safety record. This award takes into consideration size of plant, product, capacity, equipment, safety organization, etc. During the past year this mill worked 651,603 man hours with no lost time out for accidents.

The final reports on the annual safety contest of members of the paper and pulp section for the period from January 1 to June 30, 1931, showed a splendid record for 1931 as compared to the same period in previous years. Of the 125 mills reporting, 48,715,543 man hours were worked by 39,796 employees. 787 man hours were lost due to accident and only 17,263 days were lost by the group. The ratio of employment to accident was 52 to 1 and of non-fatal accidents to fatal accidents was 192 to 1. Only 23 days were lost per injury and fifteen mills, a new record, reported perfect records.

Safety Appliance Exhibitors

Exhibitors at the splendid display of safety appliances and devices which were a feature of the Annual National Safety Council meeting included the following firms: Abbott Laboratories, American Abrasive Metals Company, American Ladder Company, American Optical Company, American Social Hygiene Association, Automatic Signal Corporation, Bauer & Black, Robert A. Bernhard, Bradley Washfountain Company, Stewart R. Browne, R. H. Buhrke Company, E. D. Bullard Company, Burroughs Wellcome & Co., Chicago Eye Shield Company, H. Childs & Co., Chippewa Shoe Manufacturing Company, Cleanliness Institute, Clements Manufacturing Company, Thos. E. Collins Company, Davis Emergency Equipment Company, Dudley Lock Corporation, D. A. Ebinger Sanitary Manufacturing Company, Elliott Service Company, Finnell System, Hanovia Chemical and Manufacturing Company, Harley-Davidson Motor Company, Helios Manufacturing Corporation, Holcomb Safety Garment Company, Hynson, Westcott & Dunning, Industrial Products Company, Iodine Educational Bureau, Jewel Emblem Manufacturing Company, Johnson & Johnson, Justrite Manufacturing Company, Walter Kidde & Co., Mathias Klein & Sons, Lehigh Safety Shoe Company, Libbey-Owens-Ford Glass Company, Lima Cord Sole and Heel Company, Lincoln-Schlueter Floor Machinery Company, Mine Safety Appliances Company, Morton Manufacturing Company, Patent Scaffolding Company, Protectoseal Company, Pulmosan Safety Equipment Corporation, Pyrene Manufacturing Company, Reece Wooden Sole Shoe Company, Ruse Manufacturing Company, Safety Equipment Service Company, Safety First Shoe Company, W. H. Salisbury & Co., Leon Schiff & Co., Schwenk Safety Device Corporation, F. J. Stahmer Shoe Company, Standard Safety Equipment Company, Stonehouse Signs, Inc., Surety Rubber Company, Surty Manufacturing Company, Thompson Products, Inc., Weaver Manufacturing Company, West Disinfecting Company, Westinghouse Electric and Manufacturing Company, F. H. Wheeler Manufacturing Company and the Willson Products, Inc.

Paper Makers Chemical Corp. Merges

[FROM OUR REGULAR CORRESPONDENT]

WILMINGTON, DEL., October 19, 1931—Negotiations have been completed for the consolidation of Paper Makers Chemical Corporation with Hercules Powder Company, it was announced today by Russell H. Dunham, president of the Hercules Powder Company.

Paper Makers Chemical Corporation, with headquarters at Kalamazoo, Mich., and plants and offices in all parts of the country, is a large supplier of rosin size, coatings, alum, and other chemicals to the paper industry and is a manufacturer and jobber of a number of industrial chemicals. The concern will continue to operate under its own name and with its present organization which is headed by W. J. Lawrence of Kalamazoo, president.

Hercules Powder Company is a large producer of explosives, naval stores, cellulose products, and chemical cotton. An international marketing organization, extensive research facilities, and an increased line of paper making chemicals and materials are made available to Paper Makers Chemical Corporation through the consolidation.

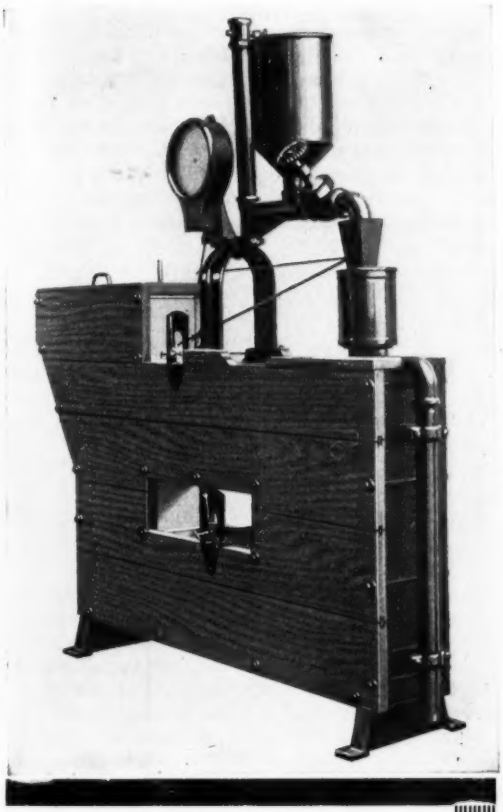
Paper Makers Chemical Corporation has fifteen plants in the United States and operates as subsidiaries Paper Makers Chemicals, Ltd., of Erith, England and Vera Chemical Co., of Freeman, Ontario.

The consolidation of interests, it was stated by the Hercules president, will afford both companies increased technical and physical resources for serving present and future customers.

Ft. Edward Reports Improvement

FORT EDWARD, N. Y., Oct. 19, 1931—Business men in this village report a considerable improvement in conditions despite the wage reduction recently placed in effect at the plant of the International Paper Company. New schedules have been observed at the mill since the cut last month and all machines are being operated. The return to full time weekly schedules has resulted in employees drawing better weekly stipends than before the reduction when curtailed schedules were in effect. Conditions at the plant are said to be improving steadily and a full complement of workers is being used in all departments.

The NEW, IMPROVED DEZURIK REGULATOR



THE ideal Stock Consistency Regulator should function automatically. It should be instantaneous in operation. All of the stock should be regulated, not just a sample. Stock consistency should be regulated to close limits. No power should be required.

The machine should require a minimum amount of maintenance. It should be compact. Little head room should be required. The very fewest parts should be used. It should sell for a price commensurate with its accomplishments.

The New, Improved DeZurik Stock Consistency Regulator meets all the above requirements.

Write the Valley Iron Works Company, Appleton, Wisconsin, today for details on this newer, improved Regulator.

Do away with guesswork. Get your stock to your paper machines properly regulated. Save time, expense and rejects from over and under weight paper.

Other "VALLEY" Equipment

Beaters
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Equipment for Paper and Pulp Mills

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New York Office: 350 Madison Ave.
Canadian Representatives: Pulp & Paper Mill Accessories, Ltd., Montreal, Canada

Demand for Paper Irregular In Philadelphia

Fine Paper Market Moderately Active With Orders for Writing Paper, Cover Stock, Book Paper and Specialties Fairly Heavy—Coarse Paper Section Continues Quiet—Kraft Wrapping Paper Easier, Affected By Keen Competition.

[FROM OUR REGULAR CORRESPONDENT]

PHILADELPHIA, Pa., October 19, 1931.—The quietness that has marked the current month continued most acute among the wrapping paper distributors, while the fine paper dealers reported a fair amount of orders acquired in certain grades of writing paper, cover stocks, book paper, and specialties. Those paper dealers who cater to bulk buyers state that the large consumers of fine paper among the publishing trades are purchasers of tonnage in growing quantities. Prices are much disturbed by keen competition. Kraft wrapping papers have again been subjected to the pruning knife of the manufacturers, with a bottom price of 3 cents per ton for kraft from southern mills.

Fine paper mills are enjoying a fair volume of business in view of general conditions. Roofing and building paper manufacturers are slightly more active. Paper boards are still drifting, with few demands of size to be garnered. Binder boards are holding, with orders of day to day type maintaining operations on from four to five day schedule. Gummed papers and tapes are in good demand as many converters are now active on Christmas orders and in production of label papers for the lithographing trade. Announcements and greeting card stocks are moving in broader quantities. Cellophane products are holding steady and growing in consumption.

Paper Trade Association Meets

When the Philadelphia Paper Trade Association met in quarterly session last week at the Down Town Club, there was taken up the special recommendation of the Quaker City Stationers' Association, that the paper trade organization revise its trade customs. This recommendation of revision in trade customs, as it has been placed before the Paper Trade Association by the Philadelphia Stationers' Association, while being discussed at the meeting, was placed in the hands of the trade relations committee for further consideration and action. President W. S. Wilcox presided, and after reporting on routine business was followed by Norbert A. Considine, of the Paper House of Pennsylvania, who reported the activities of the board of directors of the National Paper Trade Association at the recent meeting held in Detroit, which he attended as the representative of the Philadelphia Association.

Direct Mail Leaders Shown Here

The first showing of the Direct Mail Leaders Exhibit of prize winning direct mail campaigns conducted by nationally known advertisers throughout the past year will be shown for the first time outside the Direct Mail Advertisers Convention this week at the Poor Richard Club. This exhibit is compiled annually from the fifty best specimens of direct mail campaigns conducted throughout the year and is given consideration from its technical foundation, paper stocks, displays and ad matter. This year the first set of fifty will be shown to the Philadelphia trade through the Poor Richard Club where it has been brought by George W. Ward, head of the D. L. Ward Paper Company, as chairman of the educational committee of the Direct Mail Advertisers Association and of the direct mail committee of the Poor Richard Club. Another member of the Poor Richard Club responsible for bringing the first exhibition on the road to the Philadelphia organization was Norbert A. Considine, of the Paper House of Pennsylvania, member of the Direct Mail Advertisers Association and vice president of the Poor Richard Club. The Direct Mail Exhibit was brought here from the Direct Mail Advertisers Convention held two weeks ago at the Statler Hotel in Buffalo. It will be opened here at a dinner on October 22.

Scott Paper Co. Reports

The Scott Paper Co. reports for the first nine months of the current year net sales of $6,704,658.89, an increase of $214,936.13, or more than 3 per cent over the same period of 1930. Tonnage of sales during the nine months was about 15 per cent greater than the corresponding period of last year, the lower dollar percentage reflecting price reductions. Net earnings in this period to common stocks were $632,261.60, compared with $630,588.67 for the same nine months of 1930. Current assets at the end of the nine month period this year were 6.1 times current liabilities.

Charles W. Bond to Wed

Charles W. Bond, sales manager of the Charles Beck Paper Company, 401 North Broad street, will leave this week for a honeymoon, following his marriage to Miss Elizabeth N. Patterson, president of the Philadelphia Bucknell University Women's Club. The wedding will take place in Lansdowne, Pa. The groom is well known in the trade in New England and the South, where he has traveled for several years. The newly weds will return after a fortnight's honeymoon.

New Grade of Covers for Strathmore

Philadelphia distributors of the Strathmore Paper Company will shortly stock the newest grades of cover paper to be marketed by the manufacturers in their West Springfield, Mass. mills. The new line is announced as Highway Cover, an entirely novel paper in what is termed dapple finish and made in white and six colors. It has plain edges. Raymond & McNutt, Paper House of Pennsylvania, Charles Beck Paper Company and A. Hartung, Inc., Philadelphia distributors of the Strathmore papers, will stock the new line.

Standard Paper Co.'s New Stripped Gummed Tape

William Melchior, representing the Standard Paper Company, manufacturers of gummed tapes and other products, Bellow Falls, Vt., with offices in the Drexel Building, is successfully introducing the newest of products in gummed tapes of stripped effects, to harmonize with wrapping paper of similar designs and textures. The new products are in stripped sulphite papers and of various colors made by the manufacturers to correspond to wrappings of like grades. They are being stocked by the consumers in heavier volume for the coming holidays. The gummed papers in the standard lines are in fair demand this season and with growing orders the plant has been placed on a 24 hour schedule of operation and is in position to maintain this production for the remainder of the year through its advance business.

Present Trends In Bleaching

By C. M. Connor[1]

The bleaching properties of hypochlorites have long been an established fact. Notably has the use of bleach been developed in the paper and textile industries.

Long before the advent of wood pulp, bleaching powder (chloride of lime) was used in the paper trade to lighten the color of rag, jute and esparto fibers. The practical application of Tilghman's sulphite process opened a new field, for the possibilities of bleaching a nearly white wood fiber were great. Great progress in bleaching brought out the value of cooking for bleaching and of controlling the bleaching operation. Several variations of the original poacher bleaching idea were advanced, and gradually the tendency grew for multi-stage bleaching and for higher densities. With these developments came the improved methods of bleach liquor manufacture.

No Longer an Experiment

While the high-grade rag mills still held to the chloride of lime methods to a large extent (in fact, it is only recently that they have begun to enjoy the monetary saving made possible through the substitution of modern bleach-making equipment for the old chloride of lime systems), improved wood pulps—notably sulphite and soda—developed and modern mills sprung up and immediately the value of modern bleacheries was realized. Instead of powder dissolving units, the new mills began to use freshly-prepared bleach resulting from properly controlled absorption of chlorine in milk of lime. Gradually this system asserted itself, and older wood pulp mills began to bleach, making their own bleach liquor. Before many years, the idea was no longer an experiment, and now is as essential to good operation as an efficient acid plant.

Bleaching Kraft

With its application to sulphite and soda pulp solved it was quite natural that the possibilities of using calcium hypochlorite for bleaching kraft pulps be considered. Since the introduction of the sulphate process in America in 1907, several attempts have been made to satisfactorily whiten the stock without destroying those features that make it kraft. It has been often said that a bleaching method which would preserve 80 per cent of the original strength and produce a white kraft would be highly satisfactory. Bleached sulphate has been the result of bleaching brown stock with hypochlorite and that in no way resembles kraft so far as strength is concerned. In view of these facts, the Electro Bleaching Gas Company, in 1924, started a long series of experiments, embodying new ideas for the development of a white kraft without loss in strength. The work has extended up to the present time, though the poor quality of pulp which prevailed until two or three years ago as well as the lack of proper facilities for applying the ideas on a mill scale, has tended to render the development slow.

Renewed Interest

The recent renewed interests brought about by the higher grades of kraft, the existing price differential between kraft and sulphite and the very low price of chlorine has re-awakened thought on the matter, with the result that the improved ideas of bleaching have been applied.

[1] Electro Bleaching Gas Co., New York.

It was understood at an early date that chlorine in a form other than hypochlorite would give best results. It is now quite well understood that sulphite can be treated in such a manner with results which cannot be approached through the use of hypochlorite alone. The experience gained from this application to sulphite has been a great asset in the work on kraft.

The Next Logical Step

The next logical step, therefore, was to mix the lower priced kraft pulp with the more expensive sulphite and attempt to maintain the same high color. This has been accomplished with marked success, the desired characteristics in the sheet determining to a great extent the percentage of kraft that may be used. Therefore, we find that our work has begun to show results. The corrosion problems have been given some serious consideration, but have failed to present the barriers that once were considered attendant. Equipment development has taken long strides, and constant research has added to the practicability of this equipment. All of these things seem to emphasize one issue—the way is open for the development of white kraft papers made from pine and spruce at the cost not greatly in excess of the original cost of bleaching sulphite.

A Step-by-Step Proposition

It is not intended to convey the idea that any process is perfected or that no further work remains to be done. The variables which are obvious make progress a step-by-step proposition. Possibly, more marked changes in cooking and pulp handling will have to be made before we can be satisfied that the ideas might be applied to any pulp. It may result that our present routine might be shifted to advantage. However, mill results have proven the value of the basic principles involved, which value has been raised during the past six or seven years by the advent of new ideas on cooking and on pulp handling—which has brought about a great change in the quality of the pulp coming from the pulp mill. As is the case with every new thought, development and improvement will continue to result from its use and will still further demonstrate the merits of the basic ideas.

Reasons For Producing White Kraft

A question might be asked—what reasons can be advanced that warrant the consideration of ideas for producing white kraft since it must be admitted that a kraft sheet could not be substituted for a sulphite sheet in a great many instances, even though the color and strength were satisfactory? In answering this we should give consideration to the following points:—

Low Cost

First: We have a comparatively low cost pulp in kraft at present which should prove of interest to those able to substitute 100 per cent kraft for their present furnish; also to a far greater number of those who can substitute kraft for 10-60 per cent of their regular furnish.

A Definite Appeal

Second: There is a definite appeal to the kraft pulp mill operator which rests on the fact that increased usage will increase his production, thereby broadening the present

narrow margin between profit and loss, even though the selling price remains the same.

Carry Development to Wood Supply

Third: Such development will carry the demand for pulp to that section of the United States where the wood supply is most abundant, allowing for proper reforestation of areas so much in need of it.

Old Methods May Not Answer

Fourth: It is not at all evident that the highly resinous conifers will ever be cooked so that strong, white pulp can be produced by the old bleaching methods.

Economic Interest

Due consideration of the aforementioned points would make it appear that this work is of economic interest to every paper mill and to every kraft pulp mill. This is especially true during the present recovery period. The ultimate result of this interest will obviously be the real development of the so-called hard-bleaching pulps.

New Schuster Magnetic Gauge Catalog

The Schuster Magnetic Gauge, which may be used effectively for measuring paper while in process of production, is concisely described and profusely illustrated in an attractive catalog just issued by the Black Rock Manufacturing Company, of Bridgeport, Conn., eastern representatives.

Costs may be reduced considerably in the paper mill, as the Schuster Magnetic gauge will indicate, or record, or both indicate and record variations of .0001—1/10,000 of an inch in the thickness of any nonmagnetic material, such as rubber on a calender or paper on a drying roll, while the material is in motion and early enough in the process to make correction of errors possible before serious loss has been incurred.

To operate the gauge the operator simply adjusts the setting device so that the little hand on the dial is pointed to the thickness required, say for example 15/1,000. He allows the rollers of the magnet carriage to rest upon the calender roll and starts his calender, the stock passing under the rollers. He then adjusts his calender rolls to the points where the large meter hand rests at zero. When this is done his stock is 15/1,000 thick. No gauge cuts are necessary. All that the operator has to do to insure perfect gauge is to keep the hand at zero. Any deflection of the meter either to left or right of zero shows him in tenths of thousandths of an inch that his stock is running thin or thick. He then adjusts his calender accordingly.

Good Safety Records Reported

[FROM OUR REGULAR CORRESPONDENT]

ALBANY, N. Y., October 13, 1931—Several paper mill concerns in this section have made a creditable showing in the statewide accident prevention campaign being sponsored by Associated Industries. The state report for the third week of the contest just issued shows 1,304 firms competing with 253,423 workers exposed to hazards for a total of 10,397,626.95 man-hours worked. A total of 162 accidents were reported by the 1,304 firms which brings the number of accidents for the three weeks of the contest up to 384. Many of those originally interested in the campaign have so far failed to send in their weekly report to the directors. A number of concerns in this district are allotted 100 per cent ratings in the published list of the standing of those entered in the drive through their ability to avoid mishaps.

New York Trade Jottings

Donald Macauley and Warren J. Edwards, of the S. D. Warren Company, paper manufacturers, have been elected to membership of the Associated Printing Salesmen, New York.

* * *

Richard D. Wind, of the Alling & Cory Company, general paper merchants, of 317 West 37th street, New York, has been elected to membership of the Associated Printing Salesmen, New York.

* * *

C. R. McMillen, executive vice-president, has added Jules L. Stille to the sales staff of St. Regis Paper Company. Mr. Stille's desk will be at the company's main office, 60 East 42nd street, New York.

* * *

Harold Hallman, of the Continental Paper and Bag Corporation, New York, will present an address on "Cellophane Printing" at the November meeting of the Printing House Craftsmen of New York, to be held in the Building Trades Club, 2 Park Avenue.

* * *

F. W. Anderson & Co., Inc., general paper merchants, of 16 Beekman street, New York, are celebrating their 86th anniversary. The firm was founded October 20, 1845, under the name of Bradley A. Hard. The present officers are: Franklin W. Anderson, president; Randolph Nexsen, vice-president and treasurer; and John A. Howe, secretary.

* * *

Dr. Lewis H. Haney, director of the Bureau of Business Research of New York University, was the guest speaker at the regular weekly luncheon and meeting of the Eastern Division of the Salesmen's Association of the Paper Industry, held at George's Restaurant on Tuesday. Dr. Haney ably discussed the various plans for solving the business depression that have been advanced by statesmen and organizations of greater or less prominence and summed up the advantages and disadvantages of each. A spirited discussion followed. There was a large attendance of members and trade association officials, who showed their appreciation of Dr. Haney's instructive talk in no uncertain manner.

* * *

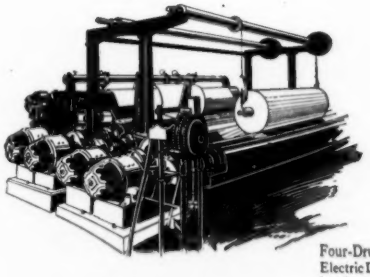
Henry Nias, president, states that in order to assist the unemployment situation, the Lily-Tulip Cup Corporation, New York, will move forward its factory operations two months in advance of current schedules anticipating inventory requirements for 1932. Instructions have been issued to operate factories in full on or about November 1. The Lily-Tulip Cup Corporation has retired through purchase of its entire issue of outstanding 7 per cent cumulative preferred stock amounting to $300,000, it was announced by President Henry Nias. The entire capitalization of the corporation now consists of 189,545 shares of common stock. The corporation has no senior securities of any kind outstanding and no bank loans.

New Receivers for Colorado Paper Co.

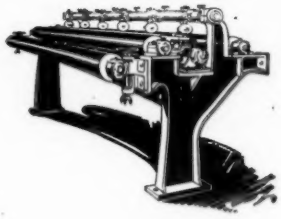
DENVER, Col., October 17, 1931.—W. W. Grant, Jr., Denver attorney, was appointed referee in the receiver litigation for the Colorado Pulp and Paper Company, by District Judge E. V. Holland, October 14.

Regardless of the fact that George W. Beck, an insurance man, has been the receiver for a long time, the decision of Judge Holland places Grant in full charge of the company's affairs.

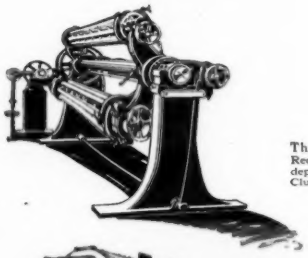
PAPER MAKING MACHINERY



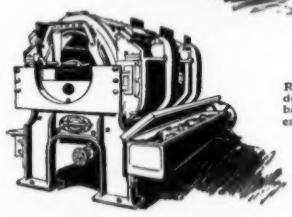
Four-Drum Winder with Electric Drive. Controls roll hardness automatically.



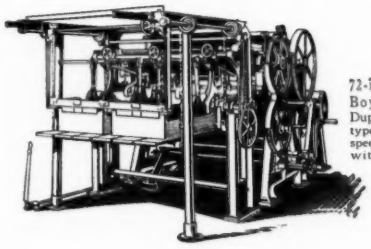
Ball Bearing Slitter Part. Quick-removable top and bottom blades give greater production with less waste.



Three-Drum Revolving Reel. Each drum has independent M&W Friction Clutch drive.



Rotary Screen, with divided diaphragms giving balanced movement and easy flow.



72-inch single Lay Boy and Cutter. Duplex and Diagonal types also made. High speeds may be used with wide cutters.

Fourdrinier Paper Machines
Quick changing wire features

Cylinder Paper Machines
for all grades of board

Bevel Gear Drive Stands
with Ball Bearings and M & W High Speed Friction Clutch

Brass Collapsible Winder Shafts
Non-sticking; quick-changing

"Criss Cross" Shower Pipes
High efficiency with low water consumption

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FOREIGN PAPER TRADE

August exports of paper and paper products were valued at $1,633,127, representing a 15 per cent decrease as compared with July shipments and a 33 per cent decrease from that of August, 1930, according to the Paper Division of the Department of Commerce. During the first eight month period a 27 per cent decline is noted when compared with the same period last year. Exports of greaseproof and waterproof papers again registered a substantial increase both over the preceding month and the corresponding month last year. Other noteworthy gains were as follows: Cash register and adding machine paper, 236 per cent over August, 1930, papeteries (fancy writings), 40 per cent, paper hangings (wall paper), 55 per cent, wall board of paper or pulp, 58 per cent and news print paper, 40 per cent, as compared with the preceding month, overissue and old newspapers, 37 per cent over August, 1930. Slight increases over the preceding month's shipments occurred in filing folders, index cards and other office supplies and bristols and bristol board. Losses of 50 per cent to 63 per cent, as compared with August, 1930, occurred in the following: Book paper, not coated, wrapping paper, surface coated paper, tissue and crepe paper, sheathing and building paper, blotting paper, papeteries and paper hangings, while losses from 30 to 45 per cent took place in our exports of cover paper, overissue and old newspapers, toilet paper, paper towels and napkins, other writing paper, vulcanized fiber sheets, strips tubes and envelopes, as compared with the corresponding month last year. Substantially lighter shipments than in July went abroad of the following: Cover paper, overissue and old newspapers, surface coated paper, toilet paper, other paper board, fiber insulating lath or board, other writing paper, cash register and adding machine paper, paper bags aand vulcanized fiber, sheets strips rods and tubes.

Exports of paper base stocks in August totaled $349,988, an increase of 112 per cent over August, 1930, but a decrease of 37 per cent, as compared with July receipts, while a 25 per cent decline occurred in the first eight months' shipments over the same period last year. Exports of pulpwood showed a notable gain as compared with a year ago, but a decrease of 90 per cent over July shipments, while during the eight month period a loss of over 50 per cent is shown, amounting to only $526,110, as against $1,255,328 in the corresponding period last year. Exports of sulphite wood pulp registered an increase of 150 per cent over August, 1930, but were slightly below July shipments, while a 23 per cent increase is noted in our exports of this commodity during the eight month period. Soda pulp exports were 50 per cent lower than in the preceding month, slightly higher than a year ago, whereas, during the eight month period there was a loss of 45 per cent. August exports of rags and other paper stock amounted to $74,337, being double those of a year ago and 22 per cent higher than in July. The eight month period, however, showed a heavy decrease over last year's record.

Imports of paper and paper products in August show an aggregate value of $9,524,134, a decrease of 7 per cent over July and a 12 per cent decrease over the same month last year. There was also a 12 per cent decrease in the total value of these products imported during the first eight months over that shown for the same period in 1930. August imports of standard news print were valued at $8,386,725. representing a 12 per cent decrease as compared with August, 1930, and a 10 per cent decrease over July. Imports of cigarette paper, cigarette books and covers continued high, showing in August an increase of 88 per cent over July and an increase of 57 per cent over the corresponding month last year. Other imports which showed noteworthy gains as compared with the preceding month were those of kraft wrapping paper, pulp board in rolls, card board, wall paper, paper boxes, papier mache and pulp manufactures, and writing paper and envelope combinations, while imports of other wrapping paper, surface coated papers, uncoated paper, decorated or embossed, and of duplex decalcomania paper, not printed were considerably less in August than in July.

Imports of paper base stocks during August were valued at $6,695,905, being a slight increase over July, but a decrease of 27 per cent as compared with August, 1930. In the eight month period they declined 47 per cent over those of the same period last year. Pulpwood imports were slightly higher than in July, but 37 per cent less than a year ago, whereas, the eight month period registered a loss of 48 per cent. Imports of rough spruce were practically double those of July while peeled spruce imports were lower. Imports of unbleached sulphite wood pulp, while being almost as high in August as in July showed a loss of 30 per cent over August, 1930, and a 34 per cent decrease in the eight month period.

Glazed and Fancy Paper Men Meet

A meeting of the Glazed and Fancy Paper Manufacturers Association was held at the Hotel Providence-Biltmore in Providence, R. I. on Tuesday, October 6, 1931. Fifteen representatives of thirteen different member mills, were present. President John V. Van Horn of the Holyoke Card and Paper Company was unable to be present due to the serious illness of his son. Vice President John MacLaurin of MacLaurin-Jones Company presided.

Paul Houston of the Marvellum Company presented a new idea for making the glazed and fancy bulletin which is sent every sixty days to a mailing list of 2200 users of glazed and fancy papers more attractive. This idea is to staple the bulletin inside of a sheet of fancy paper which has been French folded.

The executive committee presented an entire new set of by-laws which were adopted. These new by-laws divide the association into two divisions, one for distributors and one for manufacturers. Heretofore the association has been solely for manufacturers. During recent years the problems of distribution have been the ones of most moment and after consulting the distributors it was decided at the May meeting that the whole industry would benefit if the association enlarged itself to include distributors as well as manufacturers. This arrangement becomes effective at once.

The regular December meeting was left in the hands of the executive committee and it was voted to hold the annual meeting during Paper Week in New York City in connection with the annual convention of the American Paper & Pulp Association.

The need for a uniform plan for sheeting charges being adopted as a trade custom was discussed. This matter was brought to a head by a recent study that the association made based on reports from thirty-two concerns. These concerns are now using six different plans with twenty variations of these plans. This matter along with the problem of a schedule of quantities for price differences was referred to the executive committee for action.

Leonard I. Houghton, secretary reported that shipments during August for identical mills was 11 per cent ahead of August, 1930. Since the end of January shipments this year have exceeded shipments last year.

During the general discussion period it was pointed out that during a recession in business such as is now occuring individual mills cannot expect to maintain normal production. The remedy is to reduce the working hours. To simply reduce prices does not increase the consumption of our products and only causes increased financial losses.

New Brown Instrument Broadside

The Brown Instrument Company, manufacturers of pyrometers, thermometers, flow meters, indicating, recording and controlling instruments, of Philadelphia, have just published an attractive broadside featuring the Brown Electric Flow Meter. This broadside brings out a point of general interest, namely, the fact that without departmentalizing steam accounting, serious losses may occur in almost any plant using process steam, without the management being aware of the loss. Also, on the other hand, as the broadside shows, unless steam consumed by different departments is individually recorded and compared, comparative efficiency in the use of steam in one department may go unnoticed, to the damage of employee morale. Copies of this broadside may be obtained upon application.

News Print Production for September

Production of news print paper in Canada during September 1931 amounted to 178,412 tons and shipments to 178,181 tons, according to the News Print Service. Production in the United States was 91,241 tons and shipments 90,303 tons, making a total United States and Canadian news print production of 269,653 tons and shipments of 268,484 tons. During September, 24,901 tons of news print were made in Newfoundland and 1,410 tons in Mexico, so that the total North American production for the month amounted to 295,964 tons.

The Canadian mills produced 231,906 tons less in the first nine months of 1931 than in the first nine months of 1930, which was a decrease of 12 per cent. The output in the United States was 110,894 tons or 11 per cent less than for the first nine months of 1930. Production in Newfoundland was 5,860 tons or 3 per cent more in the first nine months of 1931 than in 1930 and in Mexico 1,065 tons more, making a continental decrease of 335,875 tons or 11 per cent.

During September the Canadian mills operated at 57.7 per cent of rated capacity, United States mills at 63.6 per cent, Newfoundland mills at 102.3 per cent and Mexican mills at 79.4 per cent, making a continental average of 61.8 per cent. Stocks of news print paper at Canadian mills totalled 50,451 tons at the end of September and at United States mills 33,517 tons, making a combined total of 83,968 tons which was equivalent to 4.6 days' average production.

New York Superintendents Meet

[FROM OUR REGULAR CORRESPONDENT]

SYRACUSE, N. Y., October 17, 1931.—Many prominent paper mill men of this section were in attendance at the meeting of the Northern New York division of the American Pulp and Paper Mill Superintendents Association held last week at the Onondaga Hotel in Syracuse. Dr. James E. Campbell, president of the Dexter Sulphite Pulp and Paper Company, delivered one of the principal addresses at the gathering, taking for his subject "The Sulphite Process." Among the other interesting speeches, addresses were made by Frank M. Williams, president of the Williams Apparatus Company and J. D. Haskell, secretary of the Dilts Machine Works, Inc., Fulton, N. Y., who presented a paper entitled "A Practical Bandless Beater Roll." W. J. Russell of the Snow White Company, Oswego, also delivered an address on "De-Inking Old Papers." A theme dealing with the subject of "Paper Drying" was discussed by F. C. Farnsworth.

Dean Hugh P. Baker, of the forestry department of Syracuse University and former secretary of the American Paper and Pulp Association, presided at the meeting in the role of toastmaster at the banquet which concluded the program for the day. The principal address at the evening session was given by Prof. H. J. Hillman of Syracuse University. A musical entertainment followed the session.

Collective Wage Agreements Cancelled

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., October 14, 1931—Collective wage agreements in a number of Swedish industries including the wood pulp industry, were cancelled by employers effective January 1, 1932 according to a report to the Department of Commerce. Notice was given on September 30, and it is understood that similar action is to be taken by a number of minor industries on October 31.

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Section of the
Technical Association of the Pulp and Paper Industry
Edited by Ronald G. Macdonald, Secretary

United States Patents on Papermaking

Third Quarter, 1931

Compiled by Clarence J. West, Chairman, Committee on Abstracts and Bibliography, TAPPI

NOTE.—Printed copies of patents listed below are furnished by the Patent Office, Washington, D. C. at 10 cents each. Post-Office money orders or certified checks should be sent; postage stamps will not be accepted.

JULY 7, 1931

1,812,969. Process of making integral insulating board with hard welded surfaces. William H. Mason, assignor to Masonite Corporation, Laurel. Miss. Filed Mar. 16, 1928. 2 claims. (Cl. 92-54).

1,812,970. Process of manufacturing insulating board. William H. Mason, assignor to Masonite Corporation. Laurel, Miss. Filed Jan. 23, 1929. 7 claims. (Cl. 92-61).

1,813,081. Waterproof construction material. John Homer Plunkett, assignor to The Flintkote Company, Boston, Mass. Filed Aug. 12, 1929. 9 claims. (Cl. 72-124).

1,813,184. Method for treating bagasse and similar fibrous products for the production of pulp and the extraction of cellulose. Raymond Charles McQuiston and Harry von Lorsecke, assignors to United Fruit Company, Boston, Mass. Filed Apr. 30, 1930. 8 claims. (Cl. 92-14).

1,813,205. Device for charging vessels. Werner Scholz, Oberleschen, and Arno Frohberg, Cunnersdorf, Germany. Filed Sept. 24, 1930. 4 claims. (Cl. 92-7).

1,813,362. Manufacture of paper. Harold Robert Rafton, assignor to Raffold Process Corporation, Andover, Mass. Filed Mar. 17, 1930. 21 claims. (Cl. 92-21). Use of an alkaline filler.

1,813,465. Chemical processing of cellulose pulps. George A. Richter, assignor to Brown Company, Berlin, N. H. Filed Apr. 15, 1929. 9 claims. (Cl. 92-11). Combined acid-sulphite and alkaline digestion.

1,813,531. Process for obtaining a product rich in cellulose and useful by-products from straw. Henri du Boistesselin, Rouen, France, assignor of one-half to Maurice Hurel, Aunay S. Crecy, Eure and Loir, France. Filed Sept. 13, 1929. 9 claims. (Cl. 92-9). Straw is treated at 80 deg. C. with nitric acid.

1,813,632. Preservation of fibers. Treadway B. Munroe and Elbert C. Lathrop, Chicago, Ill. Filed May 28, 1927. 15 claims. (Cl. 92-1). Method of storage of bagasse.

1,813,658. Process of manufacture of pulp and paper. Levis Miller Booth, Plainfield, N. J. Filed Oct. 5, 1928. 3 claims. (Cl. 92-21). Partially washed alkaline pulps are treated with chlorine.

JULY 14, 1931

1,813,920. Winder roll for paper-making machines. John M. Gallagher, assignor to The Bagley and Sewall Company, Watertown, N. Y. Filed Sept. 29, 1927. 4 claims. (Cl. 242-68).

1,813,988. Process for the manufacture of ground wood pulp. Allison R. Chambers, New Glasgow, Nova Scotia, Canada. Filed Jan. 31, 1929. 3 claims. (Cl. 92-6). A solution of sodium chloride is introduced into the grinding chamber.

1,814,027. System for cooking fibrous material. Thomas Leonidas Dunbar, Watertown, N. Y. Filed Aug. 1, 1929. 16 claims. (Cl. 92-11).

1,814,043. Machine for making boxes. Frank M. Joslin, assignor to Inman Manufacturing Company, Inc., Amsterdam, N. Y. Filed Apr. 11, 1929. 26 claims. (Cl. 93-51).

1,814,050. Suction roll. Robert Joseph Marx, London, England. Filed Sept. 9, 1929. 10 claims. (Cl. 92-53).

1,814,106. Manufacture of cellulose material from Musa fibers. Edward Chauncey Worden, assignor to Hanson and Orth, New York, N. Y. Filed Jan. 10, 1930. 6 claims. (Cl. 92-14).

1,814,132. Process for preparing adhesive tape. Richard Gurley Drew, assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn. Filed May 24, 1930. 11 claims. (Cl. 91-68).

1,814,135. Coated or impregnated product. Carleton Ellis, Montclair, N. J. Filed Jan. 5, 1927. 7 claims. (Cl. 215-38). Hood cap for bottles, impregnated with resinated sulphur.

1,814,155. Process of treating vegetable fibers. Theodore P. Haughey, Accomac, Va. Filed May 16, 1930. 12 claims. (Cl. 92-10).

1,814,268. Machine for producing insulating lumber, Orland R. Sweeney, Ames. Iowa, assignor to Iowa State College of Agricultural and Mechanical Arts, Ames, Iowa. Filed Oct. 19, 1929. 14 claims. (Cl. 92-39).

1,814,344. Reduction of yellowing of materials with age. Walter O. Snelling, Allentown, Pa. Filed Apr. 11, 1930. 8 claims. (Cl. 92-11). Paper tinted with a relatively permanent blue and a fugitive yellow.

1,814,369. Paper box making machine. Orph W. Cowgill, assignor to St. Louis Label Works, St. Louis. Mo. Filed July 21, 1927. 49 claims. (Cl. 93-40).

1,814,452. Pulp beating or refining machine. Thomas Downham Nuttall, assignor of one-half to Bentley and Jackson Limited, Bury, England. Filed Apr. 23, 1930. 1 claim. (Cl. 92-27).

1,814,587. Pulp refining apparatus. Fred H. Daniels. assignor to Riley Stoker Corporation, Worcester, Mass. Filed Mar. 31, 1928. 3 claims. (Cl. 92-26).

1,814,643. Composite material. William O. Stoddard, Jr., Detroit, Mich. Filed Apr. 9, 1925. 4 claims. (Cl. 154-46).

1,814,644. Composite material. William O. Stoddard, Jr., Detroit, Mich. Filed Apr. 9, 1925. 5 claims. (Cl. 154-46).

1,814,751. Process of making cornstalk fiber composition. Samuel A. Gill, Ames, Iowa, assignor of one-half to Zac D. Dunlap and Harry B. Dunlap, Ames, Iowa. Filed Mar. 3, 1928. 3 claims. (Cl. 18-47.5).

1,814,864. Wiper or cleaner for the dandy rolls of paper making machines. Peter S. Sinclair, Holyoke. Mass. Filed Oct. 22, 1929. 9 claims. (Cl. 92-50).

1,814,879. Jordan engine plug. Harry N. Weir, assignor to The Noble and Wood Machine Co., Hoosick Falls, N. Y. Filed Aug. 26, 1929. 11 claims. (Cl. 92-27).

1,814,890. Cutting machine for paper, cardboard and similar material with automatic feed. Karl Biagosch, Leipzig, Germany. Filed July 11, 1930. 8 claims. (Cl. 164-48).

1,814,916. Manufacture of bisulphite liquor and dimagnesium phosphate. Heinrich Hacel, Heuford, Germany. Filed Mar. 21, 1929. 10 claims. (Cl. 23-130).

1,815,007. Beater engine. William V. Knoll, assignor to Midwest-Fulton Machine Co., Dayton, Ohio. Filed Aug. 6, 1928. 11 claims. (Cl. 92-24).

JULY 21, 1931

1,815,136. Apparatus for making paper containers. Edward C. Angell, New York, N. Y. Filed Mar. 25, 1929. 10 claims. (Cl. 93-39).

1,815,155. Control mechanism for machines. Darcy Edwin Lewellen and Emmons Freeman Lewellen, Columbus, Ohio. Filed Oct. 8, 1928. 37 claims. (Cl. 92-27). Motor and control.

1,815,237. Process and apparatus for making paper. Lawrence W. Case, Manchester, Conn. Filed Mar. 12, 1929. 6 claims. (Cl. 92-38). Method for conditioning felt.

1,815,308. Method and means for disintegrating pulp stock. Harry Liebeck, assignor to Scott Paper Company, Chester, Pa. Filed Aug. 10, 1929. 14 claims. (Cl. 92-20).

1,815,328. Process of recovering and utilizing the valuable compounds in spent cooking liquors. George A. Richter, assignor to Brown Company, Berlin, N. H. Filed Jan. 15, 1929. 8 claims. (Cl. 23-48). Process of smelting inorganic content.

1,815,576. Process and apparatus for digesting fibrous material. Percy W. Neil, assignor to Thomas L. Dunbar, Watertown, N. Y. Filed Apr. 14, 1930. 28 claims. (Cl. 92-7).

1,815,646. Process of causticizing. John S. Bates, Harris S. Chalmers, and Percival C. Austin, Bathurst, New Brunswick, Canada; said Chalmers and Austin assignors to said Bates. Filed Aug. 9, 1926. 8 claims. (Cl. 23-185). Process of causticizing green liquor of kraft or soda pulp processes.

JULY 28, 1931

1,815,939. Dandy roll. Walter G. Trotman, South Hadley Falls, Mass. Filed May 27, 1929. 4 claims. (Cl. 92-48).

1,816,132. Rotary dewatering sieve. John Strindlund, Hurum, Norway. Filed Jan. 3, 1930. 3 claims. (Cl. 92-36).

1,816,343. Process of refining raw cellulose pulp. George A. Richter, assignor to Brown Company, Berlin, N. H. Filed May 15, 1929. 11 claims. (Cl. 92-9).

1,816,394. Process for working up material containing lignin and cellulose. Oskar Albert Müller, Zurich, Switzerland. Filed Feb. 7, 1930. 8 claims. (Cl. 92-9).

1,816,423. Method of treating wood pulp fibers and paper product made therefrom. Judson A. De Cew, assignors to Process Engineers, Inc., New York, N. Y. Filed Sept. 19, 1929. 15 claims. (Cl. 92-21). The natural resins in the pulp are covered with an emulsion of waxy material.

1,816,456. Method of making straw pulp for straw board. Max Zimmerman, Lockport, N. Y. Filed Apr. 7, 1930. 3 claims. (Cl. 92-9).

1,816,457. Method of making straw pulp for straw board. Max Zimmerman, Lockport, N. Y. Filed Nov. 10, 1930. 3 claims. (Cl. 92-9).

1,816,596. Method and means for saturating fibrous materials in the production of prepared roofing materials. Robert Maclean, assignor to Amalgamated Roofing Company, Chicago, Ill. Filed Apr. 8, 1926. 4 claims. (Cl. 91-44).

1,816,739. Process for the manufacture of cellulose. Albert Elias Nielsen, Oslo, Norway. Filed May 14, 1928. 17 claims. (Cl. 92-7). Indirect steam under circulation of the digesting liquid outside the digester.

1,816,754. Fourdrinier machine. Joseph Atwood White, assignor to The Moore and White Company, Philadelphia, Pa. Filed Nov. 20, 1930. 17 claims. (Cl. 92-45).

AUGUST 4, 1931

1,816,879. Process for the manufacture of paper pulp. Eric Wahforss, assignor to Arthur D. Little Industrial Corporation, New York, N. Y. Filed July 30, 1926. 5 claims. (Cl. 92-20). Paper from hardwood.

1,817,129. Circulating system for pulp digesters. David B. Davies, Shelton, Wash. Filed Aug. 18, 1928. 7 claims. (Cl. 92-7).

1,817,158. Debarking machine. Henry S. Mitchell, Portland, Ore., and Ralph V. Schafer, Vancouver, Wash. Filed May 22, 1929. 2 claims. (Cl. 144-208).

1,817,171. Safety paper. Burgess W. Smith, assignor to The Todd Company, Inc., Rochester, N. Y. Filed Feb. 20, 1924. 8 claims. (Cl. 283-9).

1,817,279. Treatment of jute fiber. Joseph Viallet, assignor to N. T. Artificial Wool Company, Limited, London, England. Filed Oct. 5, 1929. 2 claims. (Cl. 92-5).

1,817,413. Barking machine. Axel Gustaf Johansson, Nalden, Sweden. Filed Feb. 14, 1929. 4 claims. (Cl. 144-208).

1,817,525. Production of chemical wood pulp. George A. Richter, assignor to Brown Company, Berlin, N. H. Filed Mar. 12, 1929. 7 claims. (Cl. 92-9). Liquor contains ammonium sulphide.

1,817,539. Envelope machine. Matthew Vierengel, Brooklyn, N. Y. Filed May 4, 1929. 14 claims. (Cl. 93-62).

1,817,548. Process of producing pulp. José Martinez Estapé, Habana, Cuba. Filed Apr. 5, 1928. 2 claims. (Cl. 92-3). Paper pulp from *Cana brava* and from "carrizo."

1,817,594. Machine for separating liquids from solid bodies mixed or suspended therein. Rudolf Ernst Wagner and Johan Daniel, assignors to Aktiebolaget Karlstads Mekaniska Werkstad, Karlstad, Sweden. Filed June 6, 1930. 4 claims. (Cl. 92-39). Perforated rollers.

1,817,749. Beater engine. William V. Knoll, assignor to Midwest-Fulton Machine Company, Dayton, Ohio. Filed June 28, 1928. 21 claims. (Cl. 92-24).

AUGUST 11, 1931

1,817,923. Tube-forming apparatus. William G. Johnson, assignor to Line Material Company, South Milwaukee, Wis. Filed May 4, 1928. 8 claims. (Cl. 92-57).

1,817,972. Method of producing fibrous threads. Joaquin Julio de la Roza, Sr., assignor to Bagasse Products Corporation, New York, N. Y. Filed Nov. 9, 1926. 9 claims. (Cl. 92-10).

1,817,973. Apparatus for removing carbon and the like from cellulose. Joaquin Julio de la Roza, Sr., Tuinucu, Cuba. Filed Oct. 9, 1929. 6 claims. (Cl. 92-1).

1,818,039. Process of treating fibrous material preliminary to making pulp. John S. Busch, Cloquet, Minn. Filed Dec. 31, 1928. 2 claims. (Cl. 92-1). Crushing chips by rollers.

1,818,267. Paper machine. Nickolas J. Niks, Chillicothe, Ohio. Filed July 24, 1929. 37 claims. (Cl. 92-44). Combination of a wire and a flexible slice having a free edge.

1,818,279. Paper cup machine. Charles F. Smith, assignor to Lily-Tulip Cup Corporation, New York, N. Y. Filed Feb. 12, 1930. 18 claims. (Cl. 92-49).

1,818,681. Paper making machine. Earl E. Berry, assignor to Beloit Iron Works, Beloit, Wis. Filed Aug. 20, 1928. 11 claims. (Cl. 92-44). Head box.

1,818,712. Method and apparatus for making paper. Albert M. Hinkson, assignor to Paper Machinery Corporation, Dayton, Ohio. Filed Mar. 1, 1926. 5 claims. (Cl. 92-44).

1,818,716. Method of and apparatus for making multiply paper. Max H. Kliefoth, assignor to C. F. Burgess Laboratories, Inc., Madison, Wis. Filed Aug. 16, 1930. 14 claims. (Cl. 92-39).

1,818,719. Paper making machinery. Herman L. Kutter, assignor to The Black-Clawson Company, Hamilton, Ohio. Filed Dec. 10, 1928. 5 claims. (Cl. 92-49).

1,818,726. Paper. Joseph A. Lowe, assignor to Falulah Paper Company, Fitchburg, Mass. Filed Dec. 11, 1928. 3 claims. (Cl. 154-46). Multiply paper.

1,818,777. Paper making machine. Alonzo Aldrich and Earl E. Berry, assignors to Beloit Iron Works, Beloit, Wis. Filed May 26, 1927. 55 claims. (Cl. 92-44). Head box and slice.

1,818,897. Method of preparing and separating the cellulose material, suitable for paper manufacture, from plant raw material with pith fiber. Hachiro Kumagawa, Hongoku, Tokyo, and Kamakichi Shimomura, Nishiomachi, Hazugun, Aichiken, Japan. Filed May 31, 1927. 1 claim. (Cl. 92-20).

1,818,913. Method and apparatus for the chemical treatment of pulp. Charles R. Van de Carr, Jr., assignor to Chemipulp Process, Inc., Watertown, N. Y. Filed Apr. 12, 1928. 17 claims. (Cl. 92-7).

AUGUST 18, 1931

1,818,982. Apparatus for the production of paper glazed and/or colored on one side. Victor Antoine, Lambermont, near Ensival, Belgium. Filed Sept. 12, 1928. 3 claims. (Cl. 92-40).

1,819,002. Production of pulp of high alpha cellulose content. George A. Richter, assignor to Brown Company, Berlin, N. H. Filed Mar. 25, 1930. 3 claims. (Cl. 92-11).

1,819,003. Multiple-step process of fiber liberation. George A. Richter, assignor to Brown Company, Berlin, N. H. Filed Mar. 25, 1930. 3 claims. (Cl. 92-11).

1,819,011. Show stiffener material and art of making. Frank O. Woodruff, assignor to Beckwith Manufacturing Company, Boston, Mass. Filed Jan. 18, 1930. 10 claims. (Cl. 92-31).

1,819,041. Paper towel and the like. John C. Sherman, assignor to Brown Company, Berlin, N. H. Filed Sept. 20, 1926. 1 claim. (Cl. 91-68).

1,819,050. Jordan engine plug. Harry N. Weir, assignor to The Noble and Wood Machine Co., Hoosick Falls, N. Y. Filed Sept. 14, 1929. 5 claims. (Cl. 92-27).

1,819,078. Stencil sheet for use in duplicating typewritten or manuscript documents, drawings and the like. Armand de Waele, assignor to D. Gestetner, Limited, London, England. Filed Jan. 22, 1929. 6 claims. Cl. 41-38.6).

1,819,152. Method of treating cellulosic material. Bela Dorner, assignor to Cornstalk Products Company. Filed Feb. 28, 1927. 4 claims (Cl. 92-1).

1,819,194. Felted material and method of manufacturing the same. Treadway B. Munroe and Elbert C. Lathrop, Chicago, Ill. Filed Nov. 19, 1928. 11 claims. (Cl. 92-3).

1,819,199. Method of making building materials. Thomas Robinson, assignor to Lancaster Asphalt, Inc. Filed Sept. 12, 1927. 22 claims. (Cl. 154-2).

1,819,200. Method for making building material. Thomas Robinson, assignor to Lancaster Asphalt, Inc. Filed Sept. 12, 1927. 25 claims. (Cl. 154-1).

1,819,300. Device for and method of making fibrous cones and the like. Albert Newcombe, assignor to Jesse B. Hawley, Geneva, Ill. Filed Mar. 26, 1928. 8 claims. (Cl. 92-57).

1,819,328. Method and means for making sound amplifiers. Jesse Barnum Hawley, St. Charles, Ill. Filed May 27, 1927. 3 claims. (Cl. 92-57).

1,819,332. Gearless suction roll with extended suction box. William H. Millspaugh, assignor to Paper and Textile Machinery Company, Sandusky, Ohio. Filed Mar. 23, 1928. 10 claims. (Cl. 92-53).

1,819,435. Paper-like products and methods of making the same. Kirke L. Moses, Brookline, Mass. Filed Mar. 2, 1925. 8 claims. (Cl. 92-21).

1,819,441. Paper product and method of making the same. Harold R. Rafton, assignor to Raffold Process Corporation. Filed Mar. 15, 1928. 20 claims. (Cl. 92-21). Carbonate filler and paraffin.

1,819,531. Pulp storing and mixing machine. Carl Busch Thorne, Hawkesbury, Ontario, Canada. Filed Mar. 22, 1929. 18 claims. (Cl. 92-37).

1,819,552. Apparatus for regulating the consistency of paper stock. John F. Grabowsky, Stevens Point. Wis. Filed Oct. 26, 1929. 11 claims. (Cl. 92-46).

1,819,719. Apparatus for testing tensile strength. Alfred Schopper and Gustav Dalen, assignors to the Firm Louis Schopper, Leipzig, Germany. Filed Mar. 8, 1929. 7 claims. (Cl. 265-14).

1,819,771. Apparatus and process for producing sheets. William A. Darrah, Chicago, Ill. Filed Aug. 10, 1929. 17 claims. (Cl. 92-39).

1,819,793. Process of decorating paper. Harry M. Ross, Indianapolis, Ind., assignor of one-half to Beveridge Paper Company, Indianapolis, Ind. Filed Aug. 3, 1928. 1 claim. (Cl. 91-67.9). Embossing and coloring rolls.

1,819,840. Method and apparatus for making fiber and cement shingles and boards. Harry E. Holcomb, assignor to Fiberfraks, Inc., New York, N. Y. Filed Jan. 30, 1928. 18 claims. (Cl. 92-42).

1,819,963. Process for treatment of wood pulp by percolation. Einar Morterud, Torderod, near Moss, Norway. Filed Nov. 10, 1930. 6 claims. (Cl. 92-7).

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1,820,050. Gummed cloth. Charles H. Crowell, Fairville, Pa. Filed May 24, 1927. 2 claims. (Cl. 154-46).

1,820,122. Process of making fiber filled woven fabric. Charles H. Crowell, Bellefonte, Del. Filed Oct. 31, 1929. 7 claims. (Cl. 154-2).

1,820,165. Paper-making machine. William P. Schweitzer, Hillside, N. J. Filed May 3, 1930. 14 claims. (Cl. 92-38). Method of measuring variations of web thickness.

1,820,276. Process of wood digestion. Herman B. Kipper, Muskegon, Mich. Filed Feb. 15, 1926. 2 claims. (Cl. 92-6).

1,820,303. Deckle edging device. Prestel O. Dodge, Denver, Colo. Filed Feb. 12, 1929. 10 claims. (Cl. 92-68).

1,820,502. Bleaching cellulose pulp. John Schuber, assignor to The Champion Fibre Company, Canton, N. C. Filed June 30, 1928. 6 claims. (Cl. 8-2).

1,820,538. Process of making mineral fiber articles. Arthur L. Kennedy, assignor to Plastic, Inc., Keene, N. H. Filed June 2, 1928. 2 claims. (Cl. 92-3).

1,820,854. Save-all. Paper-making machine, etc. Joseph A. White, assignor to The Moore and White Company, Philadelphia, Pa. Filed Oct. 13, 1930. 7 claims. (Cl. 92-42).

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1,820,933. Wall board and the like for covering walls. Friedrich A. Brassard, assignor to Theodore Hemeke, Hicksville, Long Island, N. Y. Filed Jan. 21, 1929. 3 claims. (Cl. 154-459).

1,820,962. Paper manufacture. Albert L. Clapp, Danvers, Mass. Filed Sept. 26, 1928. 7 claims. (Cl. 92-21). Use of water-insoluble gel.

1,820,994. Process of and apparatus for treating fibrous materials for pulping purposes. Johan Hugo Wallin, Bengtsfors, Sweden. Filed June 22, 1929. 9 claims. (Cl. 92-7).

1,821,067. Reenforced paper and process and machine to be employed in the manufacture of the same. John W. Marshall, assignor to Helen Hood Marshall, Baltimore, Md. Filed Sept. 8, 1925. 11 claims. (Cl. 154-2).

1,821,120. Molded composition. Hugh McCurdy Spencer, assignor to The Upson Company, Lockport, N. Y. Filed Apr. 5, 1929. 5 claims. (Cl. 154-2).

1,821,138. Treatment of black liquor. Linn Bradley and Edward P. McKeefe, assignors to Bradley-McKeefe Corporation, New York, N. Y. Filed May 19, 1921; renewed Oct. 25, 1930. 9 claims. (Cl. 23-49). The caustic alkali is precipitated as aluminum hydroxide.

1,821,198. Paper manufacture. Walter J. Zimmerman, assignor to Mead Paperboard Corporation, Wilmington, Del. Filed Apr. 1, 1929. 19 claims. (Cl. 92-38).

1,821,209. Apparatus and process for making boards. William A. Darrah, Chicago, Ill. Filed Mar. 23, 1929. 19 claims. (Cl. 92-39).

1,821,317. Process for fireproofing and waterproofing textiles. Harold R. Offord and Nichols T. Mirov, Berkeley, Calif. Filed July 24, 1929. 1 claim. (Cl. 91-68).

1,821,321. Cellulose fiber for preparation of esters and process of producing same. George A. Richter, assignor to Brown Company, Berlin, N. H. Filed Aug. 28, 1926. 12 claims. (Cl. 260-100).

1,821,322. Cooking liquor for the production of sulphite pulp. George A. Richter, assignor to Brown Company, Berlin, N. H. Filed Nov. 1, 1926. 2 claims. (Cl. 92-11).

1.821,390. Composition of matter. Leon McCulloch, assignor to Westinghouse Electric and Manufacturing Company, East Pittsburgh, Pa. Filed Mar. 31, 1930. 13 claims. (Cl. 92-41). Asbestos fibers.

1,821,412. Woven wire belt for paper-making machines. Nelson W. Webb, assignor to Eastwood Wire Corporation, Belleville, N. J. Filed Sept. 10, 1929. 3 claims. (Cl. 245-10).

1,821,453. Woven-wire belt for paper-making machines. Nelson W. Webb, assignor to Eastwood Wire Corporation, Belleville, N. J. Filed Sept. 10, 1929. 1 claim. (Cl. 245-10).

1,821,454. Woven-wire belt for paper-making machines. Nelson W. Webb, assignor to Eastwood Wire Corporation, Belleville, N. J. Filed Dec. 12, 1929. 4 claims. (Cl. 245-10).

1,821,455. Woven-wire belt for paper-making machines. Nelson W. Webb, assignor to Eastwood Wire Corporation, Belleville, N. J. Filed Dec. 12, 1929. 5 claims. (Cl. 245-10).

1,821,456. Woven-wire belt for paper-making machines. Nelson W. Webb, assignor to Eastwood Wire Corporation, Belleville, N. J. Filed Dec. 12, 1929. 4 claims. (Cl. 245-10).

1,821,539. Method of making composite corrugated and solid fiber board. Paul F. Boeye, assignor to Waldorf Paper Products Company, St. Paul, Minn. Filed Mar. 7, 1927; renewed Dec. 29, 1930. 10 claims. (Cl. 154-33).

1,821,552. Roofing and method of making same. Lester Kirschbraun, assignor to The Patent and Licensing Corporation, Boston, Mass. Filed Mar. 19, 1929. 16 claims. (Cl. 154-2).

1,821,583. Paper-making machine. Arthur Schubert, Rosslau, Germany. Filed June 20, 1929. 6 claims. (Cl. 74-51). Electrically operated apparatus for controlling the path of the endless sieve.

1,821,604. Beater roll construction. Albert J. Allison, assignor to Simonds Worden White Company, Dayton, Ohio. Filed Dec. 3, 1928. 18 claims. (Cl. 92-22).

1,821,605. Apparatus for measuring the contents of moisture in chemical and mechanical wood pulp. Axel Christian Andersen, Borregaard, near Sarpsborg, Norway. Filed Sept. 29, 1927. 3 claims. (Cl. 175-183). Electrical device.

1,821,673. Method and apparatus for treating fiber-bearing plants. Herbert Shamp, Memphis, Tenn. Filed May 8, 1929. 20 claims. (Cl. 92-5).

1,821,681. Slitting means. Charles C. Van Stry, assignor to Cameron Machine Company, Brooklyn, N. Y. Filed Apr. 5, 1930. 3 claims. (Cl. 164-65).

1,821,684. Rotary pulp screen. John A. Wiener, Oswego, N. Y. Filed Jan. 6, 1931. 6 claims. (Cl. 92-36).

1,821,700. Paper-box making machinery. Paul W. Fleischer, and Martin Feybusch, assignors to New Jersey Machine Corporation, Hoboken, N. J. Filed Feb. 9, 1928. 11 claims. (Cl. 93-54).

1,821,701. Box making machinery Paul W. Fleischer, Martin Feybusch, Franz J. Hammer and Bernard D. Dans, assignors to New Jersey Machine Corporation, Hoboken, N. J. Filed June 7, 1928. 9 claims. (Cl. 93-40).

1,821,713. Paper handling device. Samuel Johansen, assignor to Walter Scott and Company, Plainfield, N. J. Filed Jan. 17, 1930. 15 claims. (Cl. 270-77).

1,821,757. Suction roll. George D. Kilberry, assignor to Downingtown Manufacturing Company, Downingtown, Pa. Filed July 18, 1929. 9 claims. (Cl. 92-53).

1,821,793. Suction roll. Charles E. Conley, assignor to Downingtown Manufacturing Company, Downingtown, Pa. Filed Aug. 29, 1929. 3 claims. (Cl. 92-53).

1,821,849. Method of preventing breaks on paper machines. Harold Robert Raiton, assignor to Raffold Process Corporation, Lawrence, Mass. Filed Dec. 11, 1928. 8 claims. (Cl. 92-21).

1,821,856. Manufacture of distended fibrous masses. Allen L. Stafford, assignor to Wood Conversion Company, Cloquet, Minn. Filed July 28, 1930. 22 claims. (Cl. 92-21).

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1,822,005. Automatic control adjusting device. Arthur E. Broughton, Minneapolis, Minn. Filed May 19, 1930. 11 claims. (Cl. 92-38). Control neutralizing device.

1,822,020. Method and apparatus for making containers of vegetable pulp. William H. Fulcher and Charles H. Wood, Oakland, Calif. Filed Apr. 9, 1928. 9 claims. (Cl. 92-64).

1,822,023. Paper machine. Wilhelm Giebeker, Konigstein-on-the-Elbe, Germany. Filed May 24, 1930. 6 claims. (Cl. 92-44). Slice, wire and means for regulating flow of water.

1,822,058. Method and machine for making articles of pulp. Eugene L. Perry, assignor to Wilbarton Ware, Inc., Kearney, N. J. Filed Oct. 6, 1928. 13 claims. (Cl. 92-54). Hollow foraminated forming and pressure rolls.

1,822,125. Method for the treatment of cellulosic materials. Charles A. Blodget and Hugo H. Hanson, assignors to Eastern Manufacturing Company, South Brewer, Me. Filed Aug. 26, 1926. 14 claims. (Cl. 92-9). Sulphite pulp is treated with sulphur in alkaline solution.

1,822,126. Method of preparing sulphite pulp for filaments and films. Charles A. Blodgett and Hugo H. Hanson, assignors to Eastern Manufacturing Company, South Brewer, Me. Filed Apr. 26, 1927. 6 claims. (Cl. 92-11).

1,822,174. Method for the treatment of cellulose and product resulting therefrom. Stewart E. Seaman, assignor to Eastern Manufacturing Company, South Brewer, Me. Filed July 3, 1926. 8 claims. (Cl. 92-13).

1,822,363. Cover for suction boxes of paper-making machines. Arthur J. Morin, assignor to Rice, Barton and Fales, Inc., Worcester, Mass. Filed Nov. 24, 1930. 6 claims. (Cl. 92-51).

1,822,508. Method of treating paper phonograph blanks. Edwin M. Schulz, assignor to Durium Products Corporation, New York, N. Y. Filed Mar. 3, 1930. 7 claims. (Cl. 154-2).

1,822,604. Measuring the freeness of pulp. Francis L. Simons, Hervey J. Skinner and Raymond M. Fuoss, assignors to Skinner and Sherman, Inc., Boston, Mass. Filed Aug. 22, 1929. 9 claims. (Cl. 92-38). Method consists in measuring its dielectric capacity.

1,822,636. Insulating material. Henry F. Winkelmann, Nebraska City, Nebr. Filed Mar. 5, 1930. 2 claims. (Cl. 154-44). Asphalt paper with filler.

1,822,779. Composition for treating pulp. Joseph Francis King, Portland, Me. Filed Jan. 28, 1931. 3 claims. (Cl. 92-9). A mixture of sodium and magnesium salts.

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1,822,891. Apparatus for making sheet material. Harry E. Holcomb, assignor to Fiberfraks Inc., New York, N. Y. Filed June 1, 1929. 9 claims. (Cl. 92-39).

1,823,258. Art of spinning and treating paper. Joseph D. Cramer and Albert J. Rogers, assignors to The Chase Bag Company, New York, N. Y. Filed Sept. 12, 1929. 1 claim. (Cl. 117-3).

1,823,405. Acoustic material. Marcus Mazer, Philadelphia, Pa. Filed June 7, 1929. 4 claims. (Cl. 154-44).

1,823,519. Manufacture of sulphite paper pulp. Alfred M. Thomsen, San Francisco, Calif. Filed Mar. 25, 1929. 2 claims. (Cl. 23-48). Method of preparing cooking liquor and of working up the spent liquor.

1,823,581. Paper-rolling machine. Hjalmar Anderson, Klippan, Sweden. Filed Mar. 18, 1929. 14 claims. (Cl. 242-55).

1,823,698. Method for treating sulphur dioxide gas. Birger W. Nordlander, assignor to General Electric Company, Schenectady, N. Y. Filed July 1, 1929. 5 claims. (Cl. 23-178). Method of removal of sulphur trioxide.

1,823,752. Method of refining the soap floating on the waste-liquor obtained in the manufacture of sulphate or sodium cellulosic as well as sulphite waste liquor. Carl Henrik Michelson, Abo, Finland. Filed Apr. 19, 1929. 13 claims. (Cl. 87-2).

1,823,792. Apparatus for the manufacture of cardboard and the like in continuous webs. Anna Engel, Bergamo, Italy. Filed Apr. 16, 1930. 7 claims. (Cl. 92-30).

1,823,845. Apparatus for dyeing paper and cardboard during the manufacture on paper making machines. Paul Schumacher, Madgeburg, Germany. Filed June 23, 1930. 5 claims. (Cl. 92-40).

SEPTEMBER 22, 1931

R18,200. Cellulose cooking. Gustaf Haglund, assignor to Patentaktiebolaget Gröndal-Ramén, Stockholm, Sweden. Original No. 1,791,476, dated Feb. 3, 1931. Application for reissue June 6, 1931. 4 claims. (Cl. 92-7).

R18,205. Stencil sheet. Herbert L. Shallcross, assignor to The Shallcross Company, Philadelphia, Pa. Original No. 1,674,611, dated June 19, 1928. Application for reissue filed June 19, 1930. 9 claims. (Cl. 41-38.6).

1,823,877. Web converting apparatus. William H. Cannard, Green Bay, Wis. Filed Jan. 31, 1928. 13 claims. (Cl. 92-69).

1,824,080. Pulp beater, extractor and cleaner. John D. Haskell, assignor to Dilts Machine Works, Inc., Fulton, N. Y. Filed Nov. 5, 1929. 20 claims. (Cl. 92-24).

1,824,221. Process and apparatus for disintegrating of fibrous material. William H. Mason, assignor to Masonite Corporation, Laurel, Miss. Filed Oct. 24, 1928. 32 claims. (Cl. 92-1).

1,824,241. Apparatus for the manufacture of boxes of cardboard and the like. Franz Reidl Stelling, Roseville, Sydney, New South Wales, Australia. Filed Oct. 15, 1930. 5 claims. (Cl. 93-56).

1,824,245. Plaster board. Clarence W. Utzman, assignor to United States Gypsum Company, Chicago, Ill. Filed Aug. 12, 1922. 5 claims. (Cl. 154-45.9).

1,824,383. Paper bag machine. William L. Taylor, Cincinnati, Ohio. Filed Aug. 3, 1928. 7 claims. (Cl. 93-8).

1,824,395. Apparatus for the measurement of stiffness of flexible materials. Tobias Dantzig and Ester C. Peterson, Washington, D. C., dedicated to the Government and the people of the United States. Filed Aug. 9, 1928. 1 claim. (Cl. 73-51).

1,824,421. Making products of finely divided vegetable material. Arthur P. Allen, San Mateo, Calif. Filed July 9, 1927. 9 claims. (Cl. 154-46).

1,824,430. Apparatus and process of treating mineral wool. Charles C. Hall, assignor to Banner Rock Corporation, Alexandria, Ind. Filed Nov. 25, 1927. 3 claims. (Cl. 92-21).

1,824,701. Treatment of wood for cellulose. Karl Gustaf Bergstrom and Arthur F. Zennstrom, Paris, France. Filed Feb. 8, 1930. 1 claim. (Cl. 92-13).

SEPTEMBER 29, 1931

1,824,772. Method of and means for collecting artificial wool. Michel Dassonville, Paris, France. Filed Sept. 28, 1929. 8 claims. (Cl. 118-1).

1,824,837. Papermaking composition. George A. Richter, assignor to Brown Company, Berlin, N. H. Filed Nov. 15, 1929. 6 claims. (Cl. 92-3). A high alpha-cellulose.

1,824,885. Wax paper. Anning Smith Hammond, assignor to Western Waxed Paper Company, Oakland, Calif. Filed Aug. 24, 1926. 9 claims. (Cl. 91-68).

1,825,155. Consistency controlling device. Sidney E. Meyers, Lockport, N. Y., assignor of one-half to Ericsson H. Merritt, Lockport, N. Y. Filed May 7, 1929. 20 claims. (Cl. 92-46).

1,825,178. Process for the treatment of fibers or fibrous materials. Robert Douglas Coghill, Roslyn, Dunedin, New Zealand. Filed Dec. 26, 1929. 6 claims. (Cl. 92-13).

1,825,307. Process of producing material rich in xylan. Elton R. Darling, assignor to Cornstalk Products Company, Inc., Danville, Ill. Filed June 19, 1929. 7 claims. (Cl. 92-13).

1,825,349. Method of manufacturing paper pulp from bagasse and other gramineae plants. Tetsudo Hagiwara, assignor to Ryoji Minra, Tokyo, Japan. Filed Apr. 10, 1930. 1 claim. (Cl. 92-11).

1,825,422. Manufacture of sheet material. Reed P. Rose, assignor to General Rubber Company, New York, N. Y. Filed Dec. 2, 1926. 8 claims. (Cl. 92-21). Rubber is introduced into the pulp.

1,825,424. Pipe insulation. Frank C. Russell and Clinton L. Savidge, assignors to The Mineral Felt Insulating Company, Toledo, Ohio. Filed Nov. 10, 1930. 6 claims. (Cl. 154-28).

1,825,492. Machine for making absorbent pads. Kurt Wandel, assignor to National Cellulose Corporation, New York, N. Y. Filed June 7, 1929. 8 claims. (Cl. 223-15).

Regain of Moisture by Papers After Heating in Accelerated Aging Test

The accelerated aging test for paper employed at the Bureau of Standards consists of heating a representative specimen for 72 hours at 100°C., and after reconditioning, determining the changes which have taken place in physical and chemical properties. The folding endurance is extremely sensitive to this treatment. Therefore, the percent retention of this property after the heat treatment is apparently one of the best indices of the probable relative life of paper.

This test has been criticized on the grounds that such treatment so changes the water absorptiveness of fibers that on conditioning the heated paper for test, the moisture content is less than that of the conditioned unheated paper, and that this difference is a large factor in the degree of loss of folding endurance. One investigator stated that when papers which had shown a large loss in folding endurance under the heat test were saturated with water before conditioning for test, they regained practically all of their original strength.

Test strips, both unheated and heated, were soaked in water for 2 months until they were thoroughly wet. Together with heated unmoistened specimens they were then conditioned at 65 per cent relative humidity. When they had reached constant weight they were tested. The test data given in the accompanying table show that, while all the conditioned moistened samples had a higher content of moisture than was present in the conditioned heated paper which was not moistened, this difference had no significant effect on the retention of folding endurance.

DATA SHOWING EFFECT OF WETTING PAPERS WITH WATER IN HEAT TEST FOR STABILITY

Sample No.	Description	Folding endurance of untreated paper: Mach. Dir., Double fold	Folding endurance of untreated paper: Cross Dir., Double folds	Change in moisture content: Heated[1] reconditioned paper, Per cent	Change in moisture content: Unheated paper conditioned, moistened and reconditioned, Per cent	Change in moisture content: Heated[1] paper, conditioned, moistened, and reconditioned, Per cent	Folding endurance of heated paper in per cent of initial: Not moistened (usual method)	Folding endurance of heated paper in per cent of initial: Moistened, Per cent
167	100% sulphite, engine sized	130	52	—0.3	+2.0	+1.3	7	3
168	70% sulphite—30% rag; engine- and tub-sized	68	72	0.0	+0.5	+0.2	36	37
169	50% sulphite—50% rag; engine- and tub-sized	400	200	—0.1	+0.8	+0.5	38	45
170	100% rag; engine- and tubsized....	4,800	3,100	—0.1	+1.8	+1.4	63	61
174	100% highly-purified wood fiber; engine- and tub-sized	3,400	1,200	—0.4	+1.6	+1.5	77	88

[1] Heated at 100° C. for 72 hours.

The Neutral Sulphite Pulping Process*

III.—Effect Of Digestion Temperature On The Rate Of Delignification

By Mark W. Bray,[1] and Paul R. Eastwood [2]

Summary

This report, adding another phase to that of the preceding report of the series, deals with the effects of temperature of digestion of black gum on the velocity of the pulping reaction. The results of the experimental work indicate that increasing the temperatures of digestion a little more than doubles the rate of the pulping reaction at every step of 10°C., over the range studied. That is, increasing the temperature 10°C., gives approximately the same yield, the same chemical properties of the resulting fibrous residue, and the same consumption of chemical, all in approximately half the cooking time.

The mathematical expressions presented show severally the relationship between the rate of lignin removal, the rate of chemical consumption, and the time and temperature of digestion.

The results help to establish the order of the pulping reaction.

Introduction

This article is the third report of a series dealing with the action of sodium sulphite and mixtures of sodium sulphite and sodium bicarbonate on hardwoods.[3]

The effect on (1) the yield, (2) the chemical properties of the fibrous residues, (3) the consumption of chemical, and (4) the rate of the pulping reaction produced through varying the temperature of digestion while other independent variables are maintained constant are discussed.

Materials

Preparation and Analysis of the Wood

The wood for these experiments came from the same 8-foot log of sound black gum *(Nyssa sylvatica)* that supplied material for the earlier ones, and was prepared as sawdust in a manner similar to that described in the second article.[3] The sawdust, ground to pass a standard sieve of 40 meshes to the inch and to be retained on one of 60 meshes, showed upon chemical analysis the characteristics given in Table 1. All percentages, except the two indicated, are based on the weight, oven-dry, of the wood charged.

TABLE 1.—CHEMICAL PROPERTIES OF BLACK GUM (NYSSA SYLVATICA)

	Per cent
Lignin	28.6
Total cellulose	57.9
Alpha cellulose (based on weight of cellulose)	73.3
Alpha cellulose	42.5
Pentosan-free cellulose	45.2
Total pentosans	20.8
Pentosans not in the cellulose	8.1
Total chlorine consumed in the isolation of the cellulose	34.0

Preparation and Analysis of the Cooking Liquor

The cooking liquor, consisting of a mixture of sodium sulphite and sodium bicarbonate (the latter calculated as sodium carbonate), was analyzed and adjusted as previously described[3] so that the ratio of sulphite to bicarbonate was 4 to 1, respectively. Just previous to cooking the liquor was finally adjusted by adding the necessary amount of one or more of the constituents, water, sodium, bisulphite, and sodium bicarbonate, until the total chemical content was 50 grams per liter.

Digestion Apparatus

The digestions were made in the same 350 cc. steel autoclave, heated electrically by means of a thermostatically controlled oil-bath, employed in previously published[4] experiments of a similar nature.

Experimental Procedure

Although the experimental procedure for these experiments was the same as that previously described[3] a brief description of the essential features is necessary for the completeness of this paper.

A 25-gram portion of black gum sawdust, previously dried for 16 hours at 150° C. was introduced into the autoclave with 125 cc. of cooking liquor containing 50 grams of total chemical per liter. The ratio of chemical ($Na_2SO_3 + NaHCO_3$) to wood was 25 per cent of its oven-dry weight, while the ratio of sulphite to bicarbonate was 4 to 1.

Upon completion of the predetermined cooking period the pulp was separated from the spent liquor by filtration on a Büchner funnel washed with hot water, with dilute acetic acid (10 per cent) and finally with 3 to 4 liters of hot water. The fibrous residue was

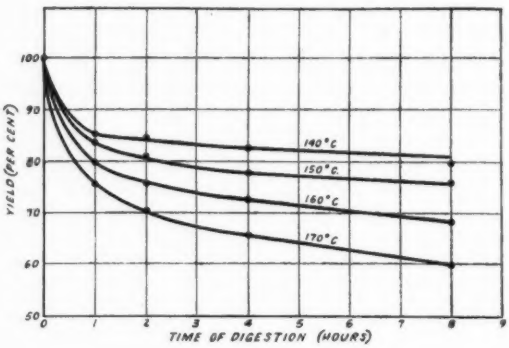

FIG. 2

Effect of temperature on yield in the experimental pulping of black gum.

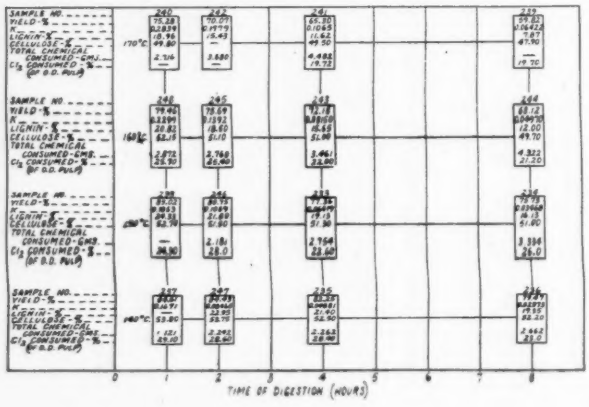

FIG. 1

Relation of temperature to other pulping variables, for black gum, in the semi-chemical process.

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[2] Junior Chemist, Forest Products Laboratory, Madison, Wis.

[3] Other papers of this series: "Chemical Studies on the Pulping of Aspen," by F. G. Rawling and J. A. Staidl, Paper Ind. 7, 901 (1925). "Chemistry of the Neutral Sulphite Process, II, Effect on Yield, Chemical Properties and Color of Pulps Produced by changing the ratio of Sodium Sulphite to Sodium Bicarbonate in the Cooking Liquor" by M. W. Bray and P. R. Eastwood. Paper Trade J. *90*, No. 25, 57 (June 19, 1930).

[4] M. W. Bray, Paper Trade J. *87*, No. 23, 64 (Dec. 6, 1928). A complete description and method of operation of the apparatus are given in this publication.

first air dried, placed in an aluminum dish provided with a tight fitting cover, and finally oven-dried to constant weight of 105°C. for the determination of pulp yield. A sample of the original spent liquor was analyzed by the same method as that employed for the white liquor.[5]

In addition to the determination of the yield of fibrous residue, the pulps were subjected to chemical analysis employing the methods[6] adopted at the Forest Products Laboratory.

Description of the Tests

Four series of pulping tests, consisting of four digestions each, were made at temperatures of 140, 150, 160 and 170° C. to determine the change in the rate of the pulping reaction and in the chemical properties of the fibrous residue with change of digestion temperature. Throughout all the tests, at any given temperature the conditions of treatment were maintained constant. In order to follow the reaction as it progressed, the time of digestion alone was varied for each temperature studied.

Discussion of Results

The results of the pulping experiments are recorded in Table 2. To assist in visualizing the relationship of the temperature to the rate of pulping the data are also graphically represented in Figure 1; the results are recorded for each digestion temperature and time of pulping. All percentages are based on the weight of oven-dry wood charged except the chlorine consumption, which is based on the weight of the oven-dry fibrous residue.

Effect of Total Time of Digestion on Yield and Chemical Properties of the Resulting Pulps

In general the results show that the pulping reaction is very rapid during the early stages of pulping, at all of the temperatures tried, (Table 2 and Fig. 1). The pulps attain a higher degree of purity with increasing total time of pulping, which is shown by their chemical properties.

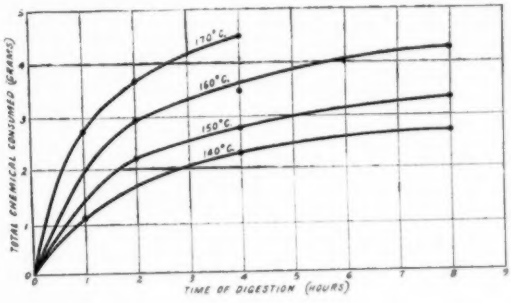

Fig. 3
Effect of temperature on rate of consumption of chemical in the experimental pulping of black gum.

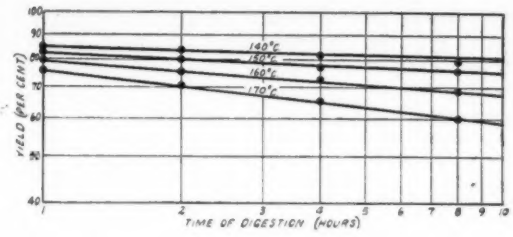

Fig. 4
The effect on yield in relation to time of digestion, caused by varying the temperature in the experimental pulping of black gum.

With a 4 to 1 ratio of sodium sulphite to sodium bicarbonate in the cooking liquor, the rate of removal of lignin and substances other than cellulose during pulping is much greater than the rate of cellulose destruction. As the pulps increase in purity, smaller amounts of chlorine are required for the subsequent isolation of the cellulose. The pentosans isolated with the cellulose are more stable, being less rapidly removed during pulping, than those not associated with the cellulose. These facts are in harmony with the results of other experiments of a similar nature previously reported.[4]

In Fig. 2, the yield data are plotted against time of digestion, while in Fig. 3 the chemical consumed is plotted in a similar manner. It might be well to mention again that the yield-time curves are similar in shape to those obtained when wood is digested under similar conditions with sodium hydroxide,[4] except that sodium hydroxide reduces the wood to pulp more rapidly than these neutral cooking liquors. Therefore, upon plotting sets of these yield data obtained from digestions of 1 to 8 hours against time of digestion, on single logarithmic paper as in Fig. 4, a series of straight lines similar to those for the alkaline process should be expected to form. This result indicates that the yield-time relationship approaches the form of an hyperbola, as stated in the earlier article.[4]

Velocity constants were again calculated from the yield data as though the reaction were of the first order by means of the equation:

$$K = \frac{2.3025}{t} \cdot \log \frac{W}{(W-x)}$$

Where K is the velocity constant, W is the percentage of wood taken at the beginning of the reaction, namely, 100 per cent, x is the percentage removed during the progress of the reaction, and t is the total time of digestion. Then $(W-x)$ is the residue of pulp remaining after any period of digestion. The values for any given temperature decreased regularly with time of digestion, like those for the soda process, (Table 2, Col. 7). Because of the regular decrease with time of pulping the data may be used under a given set of conditions for predicting yields.

[5] Bray, Paper Trade J., 87, No. 25, 59 (Dec. 20, 1928).

TABLE 2.—THE EFFECT OF DIGESTION TEMPERATURE ON THE VELOCITY OF PULPING IN THE DELIGNIFICATION OF BLACK GUM WITH A MIXTURE OF SODIUM SULPHITE AND SODIUM BICARBONATE

Chemical added: 25 per cent of the weight oven-dry of the wood charged. Total concentration: 50 grams per liter

Digestion number	Digestion conditions: Total time of digestion Hours	Temperature °C	Weight oven-dry of wood charged Grams	Weight oven-dry of residue Grams	Results of digestion: Yield of pulp Per cent	Velocity constant K	Total chemical consumed Grams	Chlorine consumption [1] Per cent	Analysis of pulps based on weight of oven-dry wood: Lignin Per cent	Cellulose: Total Per cent	Cellulose: Pentosan-free Per cent	Cellulose: Alpha cellulose Per cent	Pentosans: Total Per cent	Pentosans: In cellulose Per cent	Pentosans: Not in cellulose Per cent
			Analysis of wood					34.0	28.6	57.90	45.15	42.50	20.75	12.74	8.01
237	1	140	25.2665	21.3795	84.61	0.16710	1.121	29.1	...	53.80	44.23	35.20	16.82	9.57	7.25
247	2	140	25.2510	21.3185	84.43	.08465	2.242	28.5	22.95	53.75	43.75	48.70	15.36	10.00	5.36
235	4	140	25.2330	20.7575	82.25	.04881	2.262	28.4	21.40	52.50	42.90	46.70	14.20	9.60	4.60
236	8	140	25.3810	20.1690	79.47	.02873	2.667	23.0	19.35	52.20	43.20	37.60	12.10	9.00	3.10
238	1	150	25.3930	20.4660	83.00	.18630	...	24.3	24.33	52.70	43.27	46.20	16.27	9.43	6.84
246	2	150	25.2520	20.2900	80.35	.10690	2.181	28.0	21.80	51.50	42.64	46.20	15.22	8.86	6.36
243	4	160	25.4050	18.3370	72.18	.08150	3.461	22.6	19.13	51.30	41.50	44.40	15.10	9.80	5.30
234	8	150	25.3380	19.2000	75.73	.03468	3.334	26.0	16.13	51.00	42.24	39.10	13.00	8.76	4.24
248	1	160	25.2990	20.1035	79.46	.22990	2.872	25.7	20.82	52.15	42.64	46.0	15.70	9.51	6.19
245	2	160	25.2435	19.1075	75.69	.13920	2.768	25.4	18.50	51.10	41.58	37.50	15.02	9.52	5.50
243	4	160	25.4050	18.3370	72.18	.08150	3.461	22.0	15.65	51.00	41.82	45.20	15.38	9.18	6.20
244	8	160	25.2370	17.1935	68.12	.04797	4.322	21.2	12.00	49.70	41.06	42.70	12.97	8.84	4.13
240	1	170	25.3535	19.0860	75.28	.28390	2.716	23.4	18.96	49.80	40.57	35.35	13.40	9.23	4.17
242	2	170	25.2690	17.7055	70.07	.17290	3.680	...	15.43	...	...	...	13.04	...	....
241	4	170	25.3310	16.5425	65.30	.10650	4.482	19.7	11.62	49.50	40.99	43.10	12.15	8.51	3.64
239	8	170	25.3475	15.1640	59.82	.06422	....	19.7	7.87	47.90	39.67	33.20	11.82	8.23	3.59

[1] Based on the weight of the oven-dry residue.

Fig. 5 shows the result of plotting the velocity constant K against time of digestion on logarithmic paper. The relation between K and t, shown graphically in Fig. 5 may be expressed analytically by the equation:

$$K t^a = c$$

$$\text{or} \qquad \log K + a \log t = \log c \qquad (1)$$

where K is velocity constant, t the time of digestion in hours, a the slope of the line, and c the intercept on the k axis.

Effect of Temperature of Digestion on Pulp Yields

In pulping by the soda[4] process and also by the sulphite[5] process it has been found that an increase in temperature increased the rate of the pulping reaction. This increase in reaction velocity is evidenced by lower yields and higher purities of pulps obtained for a given period of digestion.

Fig. 1 shows that for a 10° C. rise in temperature, the velocity of the pulping reaction is somewhat more than doubled; that is, approximately equal yields of pulp having nearly the same chemical properties and with an equivalent consumption of chemical during pulping are obtained in half the digestion time.

The change in the velocity of the pulping reaction with temperature increase is also reflected in the change in slope of the family or straight lines of Fig. 5. A mathematical relationship between temperature and the slope of these lines may be obtained through dividing the slope a of the lines by the corresponding temperature and plotting on rectangular coordinate paper, against the temperature of pulping, the quotient that results. The consequent curve, shown in Fig. 6, is linear. Its equation may therefore be derived by substituting the proper values in the general formula of a straight line,

$$y = mx + b,$$

where the constants m and b are respectively the slope and the intercept on the vertical axis. The equation relating to digestion temperature the slope a of the K-time curves, which is a function of the reaction velocity, may be expressed as follows:

$$\frac{a}{T} = -0.00006745T + 0.015603$$

$$\text{or} \qquad a = -0.00006745T^2 + 0.015603T \qquad (2)$$

where a is the slope of the K-time curve of Fig. 5 and T is the temperature of pulping expressed in degrees centigrade.

In order to derive the relationship between the temperature of pulping and the rate of the pulping reaction it is necessary to obtain the relationship between the slopes a of Fig. 5, the values of the velocity constant K, and the time of pulping. The initial step is to determine the value of C in terms of other factors, so that the fundamental equation (1) may be simplified; a is the single other factor ultimately desired. Upon plotting on semi-logarithmic paper the various values of C at one hour of pulping,

[4] Miller and Swanson, Ind. Eng. Chem. 17, 843 (Aug. 1925).

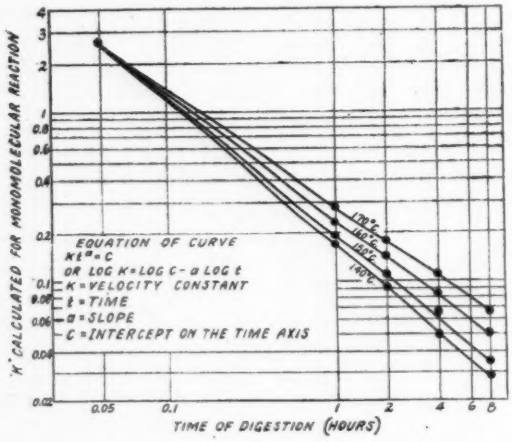

Fig. 5
Relation of velocity constant to time of digestion of black gum.

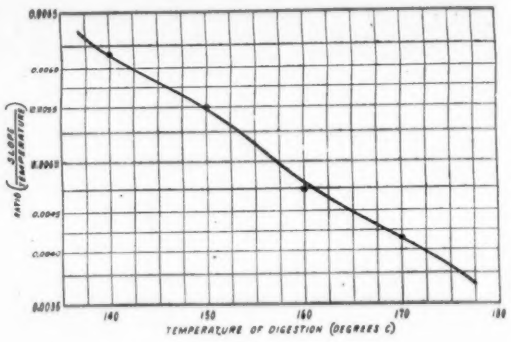

Fig. 6
Ratio of the slope of the velocity constant curves to the temperature of digestion, in relation to the temperature of digestion.

where time is unity and log t is therefore zero, and C consequently is equal to K, against the corresponding slopes a, a straight line is obtained. (Fig. 7.) This relationship indicates that the value of C (equation (1) and Figure 5) may be expressed by the equation

$$C = (Z)10^{-ba}$$

$$\text{or} \qquad \log C = \log Z - ba$$

where Z is the intercept on the vertical axis of Fig. 7 (values of K for $t = 1$, to which C is equal) and b is the slope of the line. The values of Z and b are measured directly from Fig. 7 and are found to be 2.68 and 1.393, respectively.

Thus the equation relating C to the slope a of the K-time curves is:

$$C = (2.68)\ 10^{-1.393a} \qquad (3)$$

Substituting equation (3) in equation (1), the following expressions are obtained:

$$Kt^a = (2.68)\ (10)^{-1.393a} \qquad (4)$$

$$\text{or} \qquad \log K + a \log t = \log 2.68 - 1.393a \qquad (5)$$

The value of K, the velocity constant for a monomolecular reaction, is calculated from the following formula:

$$K = \frac{2.3025}{t} \log \frac{100}{\text{yield}} \qquad (6)$$

Hence upon substituting in equation (4), the following expression is obtained:

$$(t^a)\ \frac{2.3025}{t} \log \frac{100}{\text{yield}} = (2.68)\ 10^{-1.393a}$$

$$\text{or}$$

$$\log \frac{100}{\text{yield}} = \frac{(2.68)\ t}{(2.3025)\ (t^a)\ (10)^{1.393a}}$$

$$\log 100 - \log \text{yield} = \frac{1.164\ t}{(t^a)\ (10)^{1.393a}} \qquad (7)$$

If the value for a in terms of temperature, T, from equation (2)

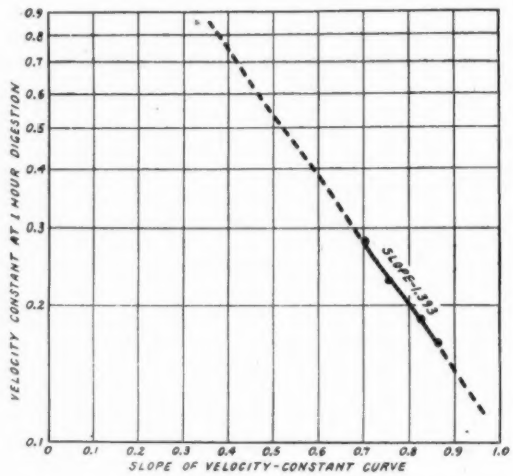

Fig. 7
The relation of the velocity constant at one hour of digestion to the slope of the velocity—constant curve.

is substituted in equation (7), the following expression, showing a relationship between the yield of pulp and the time and temperature of digestion, is obtained. This relationship holds only when the digestion temperature is maintained constant within the range tested.

$$\text{Log yield} = 2 - \frac{1.164t}{t(-0.00006745T^2 + 0.015603T)\ 10\ (1.393)\ (-0.00006745T^2 + 0.015603T)}$$

or

$$\log \text{ yield} = 2 - \frac{1.164t\ (1 + 0.00006745T^2 - 0.015603T)}{10\ (1.393)\ (-0.00006745T^2 + 0.015603T)} \qquad (8)$$

where

$$\text{yield} = \frac{\text{weight oven-dry residue}}{\text{weight oven-dry wood}} \times 100$$

t = time of pulping in hours
T = temperature of pulping in degrees centigrade

From (8) it is possible under the laboratory conditions employed to predict the yield, within ± 1.0 per cent of the observed value, for any time and temperature of pulping.

Effect of Temperature of Pulping on Chemical Properties of the Pulps

As previously stated, the data of Table 2 and Fig. 1 indicate that increasing the temperature of digestion increases the velocity of the pulping reaction, but has little effect on the chemical properties of the resulting pulps when the reaction occurs under similar conditions and is carried to the same yield. The relative rates of removal of lignin, pentosans, and of substances other than cellulose do not materially change with change of digestion temperature. Consequently, in pulping down to the same yield, within the temperature range of the experiments set forth, pulps of similar chemical properties are obtained regardless of the digestion temperature employed.

Determination of the Order of the Delignification Reaction

Since constant values were not obtained for K, upon substituting the pulping values in the equation for a monomolecular reaction, the reaction is of a higher order than the first.

The fundamental equation for a second order reaction is expressed as follows:

$$\frac{dx}{dt} = mC_1C_2 \text{ or } \frac{dx}{dt} = m\ (A - x)^2$$

or

$$\frac{dx}{dt} = -\ mx^2 \qquad (9)$$

where x = concentration of reactant at any time
t = time the reaction proceeds
m = reaction velocity constant

To employ equation (9) for testing the order of the reaction it is necessary to make certain assumptions based upon the relative numbers of the two kinds of molecules present, namely, that one of the reactants remains practically constant with respect to the other as the reaction proceeds. Since the chemical molecules far outnumber the larger lignin molecules it may be assumed, for practical purposes, that the former remain constant throughout the reaction as far as the lignin molecules are concerned. Thus it may be considered that the reaction proceeds as though the lignin molecules alone were affected and not as though the reaction were taking place between lignin and chemical molecules which is probably contrary to actual fact.

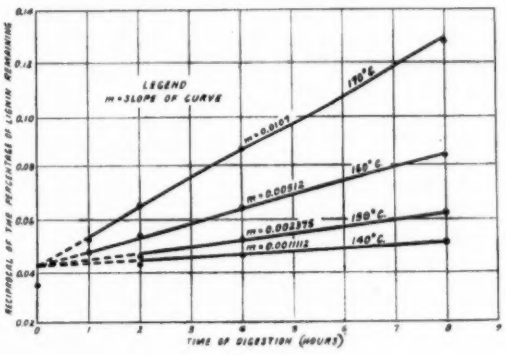

Fig. 8
Relation between the reciprocal of the lignin concentration and the time of digestion of black gum.

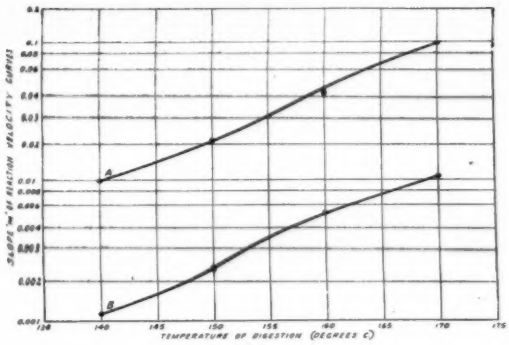

Fig. 9
Effect of temperature on the velocity of digestion of black gum in the semi-chemical process. A. Variation in the rate of chemical consumption with change in temperature. B. Variation in rate of lignin removal with change in temperature.

Upon integrating equation (9) between the proper limits, as expressed in (9a) the general equation (10) is obtained.

$$\int_{x_0}^{x_1} \frac{dx}{x^2} = -m \int_{t_0}^{t_1} dt \qquad (9a)$$

$$-\frac{1}{x}\Big|_{x_0}^{x_1} = -mt\Big|_{t_0}^{t_1} \qquad (10)$$

Thus if a straight line is obtained when the reciprocal of the concentration of the reacting substance is plotted against the time of digestion on rectangular coordinate paper the reaction is probably bimolecular.

In this study, it was found that a family of straight lines on rectangular coordinate paper is obtained, as shown in Fig. 8, when the reciprocal of the lignin concentration (the reciprocal of the percentage by weight of lignin remaining in the residue) is plotted against the time of digestion for the several temperatures studied, namely, 140, 150, 160, and 170°C. Upon plotting on semi-logarithmic paper the slopes of these lines, against temperature of pulping the points fall on a straight line as shown in Fig. 9. The slopes (m) of these lines may be expressed by the general equation

$$m = A10^{bT} \qquad (11)$$

where A and b are constants, which may be determined graphically if desired or, with greater accuracy, by the logarithmic form of equation (11)

$$\log m = \log A \pm bT.$$

Since there are two unknowns in this equation, namely, A and b,

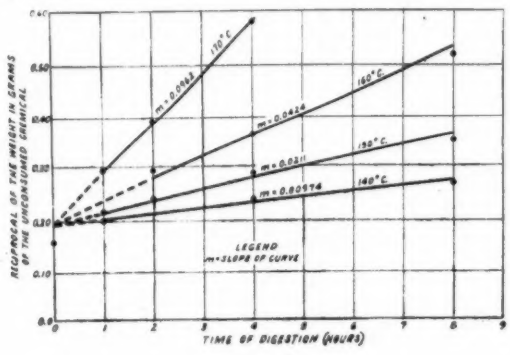

Fig. 10
Relation between the reciprocal of the amount of unconsumed chemical and the time of digestion of black gum.

two values of the velocity constant m obtained by experiment and their corresponding temperatures must be substituted in it. The two equations may be solved simultaneously for A and b, where it was found that A equals 0.00000002856 and b equals 0.032786. The mathematical relation between the slope (m) and the temperature is thus expressed:

$$m = 0.00000002856\ (10)^{0.032786T} \qquad (12)$$

When the value for m as given numerically in equation (12) is substituted in the general integrated equation for a bimolecular reaction (10), the resulting formula shows the relationship between the concentration of lignin remaining in the treated wood and the time and the temperature of digestion. Upon substituting the proper limits in equation (10) in which 28.5 represents the percentage of lignin in the original wood and x_1 is the amount of lignin remaining in the pulp at any time, t, of digestion the following expression is obtained:

$$\int_{28.5}^{x_1} \frac{dx}{x_2} = -m \int_0^{t_1} dt$$

or upon integrating,

$$-\frac{1}{x}\Bigg|_{28.5}^{x_1} = -mt\Bigg|_0^{t_1}$$

$$\text{Hence } \frac{1}{x_1} - \frac{1}{28.5} = mt_1$$

$$\frac{1}{x_1} = mt_1 + 0.0351$$

$$x_1 = \frac{1}{0.0351 + mt_1}$$

Substituting the value of m from equation (12) in the general form

$$x_1 = \frac{1}{L_0 + (A10^{bT})t_1} \qquad (13)$$

in which L_0 is the reciprocal of the lignin concentration of the original wood, namely $\frac{1}{x}$ — in (10) equation (13) becomes

$$x_1 = \frac{1}{0.0351 + (0.00000002856)\ (10^{0.032786T})\ (t_1)} \qquad (14)$$

Equation (14) shows the relationship between the concentration of lignin and the time and temperature of digestion. Because of the very rapid rate of delignification during the initial stages of the pulping reaction, however, a correction must be made for the constant 0.0351 in this expression. The lines in Fig. 8, instead of intersecting at the ordinate 0.0351, converge at the ordinate 0.043. It is therefore necessary to apply correction to equation (14). The corrected formula becomes:

$$x_1 = \frac{1}{0.043 + (0.00000002856)\ (10^{0.032786T})\ (t_1)} \qquad (15)$$

where x_1 is the percentage of lignin by weight (based on the original oven-dry wood) remaining in the pulp for any time, t, of pulping at the digestion temperature, T.

A similar calculation can be made for the consumption of chemical with time of pulping for any of the temperatures studied, namely 140, 150, 160, and 170°C. Upon plotting on rectangular coordinate paper, against the time of digestion, the reciprocal of the weight in grams of the chemical remaining after any period of digestion, a family of straight lines is again obtained, the slopes of which lie on straight lines, similar to those just described for lignin, when they are plotted on semi-logarithmic paper against the respective temperature of pulping.

Thus the slopes (m) of the lines given in Figure 10 may also be expressed by the general equation (11) namely, $m = A10^{bT}$. The constants A and b are obtained algebraically as previously explained and are (0.00000022235) and (0.033154), respectively. The formula relating slope m to temperature of digestion T then becomes,

$$m = (0.00000022235)\ (10)^{(0.033154T)} \qquad (16)$$

From this information an equation can be derived to give the relation between chemical consumed, expressed in grams, and time and temperature of digestion. This relationship is shown numerically in equation (17) where the weight of chemical consumed = the weight of chemical added — the weight of chemical remaining.

$$\text{Chemical consumed (grams)} = 6.25 - \frac{1}{195 + (0.00000022235)\ (10^{0.033154T})\ (t)} \qquad (17)$$

It may be deduced from the preceding discussion, relating the rates of lignin removal and chemical consumption, that, for practical purposes, the pulping reaction herein described proceeds similarly to those of the second order.

Since the preceding conclusion is based, as previously stated, upon the assumption that the chemical molecules remain practically constant throughout the reaction as far as the lignin molecules are concerned, the pulping or delignification reaction is probably more complex than can be expressed by the general formula for a reaction of the second order. This assumption, however, is probably valid and the simplified formula for a second order reaction may be used because of the relative numbers of the two kinds of molecules present. The molecules of chemical so far outnumber the lignin molecules that the former appear to remain constant as far as the lignin molecules are concerned.

Under the conditions of this investigation, the order of the reaction in the pulping of black gum with mixtures of sodium sulphite and sodium bicarbonate appears to be above monomolecular, since constant values are not obtained, either for yield or for lignin, when the proper experimental results are placed in the formula of a reaction of the first order. The velocity constants, K, when calculated as though a first order reaction obtained decrease with time of pulping. The mathematical formulae derived from them, however, are of value for the prediction of yields and for better control of the pulping reaction.

Upon substituting the proper values in the general formula for a bimolecular reaction it was found, for all practical purposes, that the reactions involving lignin removal and chemical consumption proceeded as though the pulping reaction were one of the second order. This statement appears valid only when the assumption is made that the chemical molecules, so far outnumbering the larger lignin molecules, remain constant throughout the reaction as far as the latter are concerned and that the removal of lignin and the consumption of chemical are considered separately.

Permanence Qualities of Book Papers

Test of current commercial book papers have been made at the Bureau of Standards relative to their value for the preservation of valuable records. The properties studied were their strength, chemical purity, both cellulosic and non-cellulosic, and their stability under an accelerated aging test made by heating them. As with other types of record paper studied, their quality for permanent records was found to be dependent on their strength and purity, neither of which bore a close relation to the kind or quality of the fibrous raw materials employed in their manufacture. In general, these papers were found to have poorer quality for permanent record use than those found in writing papers, and this is attributed to the more severe treatment given the fibers in obtaining the required printing qualities.

Based upon a classification system previously devised for record papers and on the test results obtained for the book papers, a suggested classification of papers for use in publications has been formulated. This details qualities considered desirable in papers for all types of printed records, permanent to temporary.

A detailed report of this study is contained in the September issue of the Bureau of Standards Journal of Research, as Research Paper No. 349, "Permanence Studies of Current Commercial Book Papers," by J. O. Burton.

Current Paper Trade Literature

Abstracts of Articles and Notes of Papermaking Inventions Compiled by the Committee on Abstracts and Bibliography of the Technical Association of the Pulp and Paper Industry

Clarence J. West, Chairman

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Paper Specialties

Factors Influencing Drier Performance. E. C. Stamm. The Upson Co., Lockport, N. Y. Paper Trade J. 92, No. 24, 83-85 (June 11, 1931); Paper Mill 54, No. 24, 5, 20, 22 (June 13, 1931).—From a discussion of the various factors affecting paper drying performance, the author recommends the following precautions to obtain the best possible performance from a set of driers: keep driers clean both inside and out; keep the sheet pressed as tightly to the driers as permissible; maintain enough circulation through each drier to prevent accumulation of air; inspect the driers regularly with a surface pyrometer to detect those in which the syphon pipes may be out of order.—A. P.-C.

Comparison of Atmospheric and Vacuum Dried Pulp. J. S. Babbitt. Pulp Paper Mag. Can. 31, 813-816; 830-831, 842, 844 (July 9, 16, 1931).—A discussion bringing out the advantages of vacuum drying over atmospheric drying. Experimental evidence is advanced to show that bursting and tearing tests of vacuum-dried pulp are practically the same as those of the wet pulp, which more than compensates for the slightly higher tearing resistance of atmospheric dried pulp, and that oxidation and hydrolysis effects are decreased in vacuum as compared with atmospheric drying.—A. P.-C.

Dryers of a Paper and Pulp Machine. E. Lutschen, Papier-Fabr. 29, No. 20, 305-310, (May 17, 1931).—For the most efficient evaporation and for the initial moisture content of each cylinder, there is only one determined temperature, with a small variation between the top and bottom. Each cylinder must be capable of regulation so that the initial moisture content and the end moisture content will be in accordance with the drying curve. The separation of the air and gas in the cylinder is very detrimental to the drying process, because it hinders the transfer of heat and makes the removal of the condensate from the cylinder difficult. It was also determined that the gas in the outlet line formed a cushion for the condensate being removed when the line is completely filled with water to a certain position. A complete removal of the condensate from the cylinder is only possible when the condensate line is correctly designed. An air separator should be placed in a vertical position immediately after the line leaves the drying cylinder, thus removing the air in the drying cylinder and from the line going to the steam trap. The reduction of the back pressure by recovering the heat in the steam should be done with a condensor according to Lutschens method which is described in the article. Numerous curves and illustrations are given—J. F. O.

Removal of Water from Pulp by Means of Suction Filters with Special Reference to the Nebrich Suction Filters. H. Kienzl, Papier-Fabr. 29, No. 20, 310-313, (May 17, 1931).—The principle of the suction filter is described. The construction and operation of the Oliver filter, Wolf filters and Kamyr filters are discussed, together with information concerning the construction and advantages of the Nebrich filter. A vacuum of 6 centimeters is produced by a barometric pipe. Experiments were conducted with a Nebrich filter of 3¾ square meters filtering surface. By constant speed of rotation and pressure, the moisture content of the filter cake is rather constant even with great variations of dilution from 1:140 to 1:440, the moisture content of the cake being from 21 to 25 per cent. The capacity depends on the dilution of the stock and varies from 500 to 1400 kilograms absolute dry stock. By dilution to 600 and more the moisture content of the filter cake increases greatly due to the pressing. By increasing the speed of rotation of the filter drum from 14.7 to 28.9 meters per minute the capacity of the filter increased from 740 to 930 kilograms per hour. The capacity per meter of length is up to 35,000 kilograms per 24 hours. The fiber loss consists of 6 grams per cubic meter of waste water, using a number 30 screen and with the de-watering of unbeaten sulphate pulp.—J. F. O.

Relations on Paper Machines Using Saturated and Superheated Steam. F. Kaiser, Wochbl. Papierfabr, 62, No. 19, 450-454, (May 9, 1931) and No. 21, 499-503, (May 23, 1931).—The temperature of a certain place on the drying cylinder remains practically constant due to the rotation of the cylinder. The wall temperature is lowest in the neighborhood of the steam inlet and highest where the condensate leaves the cylinder, but these temperature differences may be lessened by the proper design of the steam inlet. The wall temperature increases with increase in super heat at a determined pressure. The wall temperature also increases with the pressure at constant steam temperature. In all the experiments the average wall temperature on the inner side was about 2.6° lower than the temperature of the saturated steam at the corresponding pressure. The condensate was cooled about 1.5° lower than the temperature of the saturated steam at the corresponding pressure. The coefficient of heat transfer of the steam on the wall is lower with super-heated steam than with saturated steam. The coefficient of heat transfer increases with the pressure at the same steam temperature. Considerably more heat is given up at the cylinder walls when wet paper is being dried than with dry paper. With a steam pressure of 1.19 atmospheres, the same amount of heat is given up with completely wet paper as with 1.65 atmospheres at the dry end of the web. The heat capacity of the cylinder increases in a linear function with the temperature of the wall. There is an 8 per cent increase in the heat given up per 100° steam super heat at a pressure of 1.42 atmospheres in the cylinder against a 3 per cent increase at 1.19 atmospheres. When using super heated steam great attention must be taken so that the fibers are not injured. If the steam pressure has been increased to the limit of the strength of the cylinder, an increase in the capacity of the machine is possible by going over to super heated steam, providing the paper can stand the increase in steam temperature. The steam temperature can change appreciably before any noticeable change in the wall temperature occurs. By suitable regulating devices the steam temperature should vary only slightly.—J. F. O.

Moisture Regulator for Paper and Similar Webs. Josef Muchka, Vienna. Aust. pat. 120,248 (July 15, 1930).—A device for the regulation of the moisture content of a sheet of paper, in which the sheet being dried is led over a sensitive device as the sheet goes over the driers. The change in length due to shrinkage is transformed to the heat regulator for the dryers.—J. F. O.

Calender for the Pressing of Webs of Paper and Similar

Materials. Joh Kleinewefers Sohne, Krefeld, Germany. Swed. pat. 70,632 (April 3, 1929).—The device for loading the rolls is regulated by means of a hydraulic double cylinder each with two opposite acting pressure pistons which influence the load lever. One of the pistons is coupled directly and the other by means of a connecting rod to the load lever which is at each side of the calender.—J. F. O.

Arrangement for Conveying Air for the Airing on Both Sides of a Flat Lying Material. Hermann Haas, Lennep, Germany. Aust. pat. 120,931 (Aug. 15, 1930).—Of the four rectilinear centrifugal blowers arranged side by side, the two middle ones blow directly upon the sheet of paper while the air from the other two blowers is conducted through a half circular shaped conductor to the opposite side of the sheet.—J. F. O.

Arrangement for Cylindrical Vacuum Drying Apparatus Rotating or Suspended on Rollers. A. E. Jonsson, Lidingo, Swed. pat. 70,968 (Feb. 14, 1928).—The apparatus contains heating bodies cellular in its longitudinal direction for the heating and the dividing of the material to be dried.—J. F. O.

Process for the Removal of Water from Wet Board and Similar Materials. R. Kastner, Steyrermuhl and H. Schmolka, Vienna. Aust. pat. 120,690 (Aug. 15, 1930).—Addition to Aust. pat. 115,901.—The addition of heat to board which has first been pressed for the partial removal of water, and then piled up with metallic screens or solid sheets of plate (preferably zink or galvanized iron) between single bundles, is done in an electrical way. This is accomplished by using the mist board as a heat resistor and by using the metallic plates as electrodes.—J. F. O.

Device and Process for the Drying of Board and Similar Materials. Richard Pruckner, Vienna Aust. pat. 120,700 (Aug. 15, 1930).—The pile being pressed is enclosed within a housing in order to be able to increase the drying by lowering the temperature and pressure. A vacuum is maintained within the housing at times during the pressing. The pressings follow each other and each succeeding pressing is at a higher pressure.—J. F. O.

Dewatering Pulp. J. Strindlund. Brit. pat. 336,879.—In cylinders for dewatering pulp, the peripheries comprise separate chambers of cells, each of which is provided with an outflow pipe or passage backwards in relation to the direction of rotation. During rotation the pipes fill with water and remain filled after their corresponding chambers pass out of the pulp in the vat and produce a suction effect to increase the dryness of the pulp, which may be pressed by dandy rolls and removed by a roll from which it is scraped off.—A. P.-C.

Cleaner for Paper Driers. Arthur E. Broughton assignor to Broughton Co. U. S. pat. 1,794,058 (Feb. 24, 1931).—The cleaner consists of a scraper extending longitudinally of and in engagement with the drying roll. The edge of the scraper in contact with the roll is capped with a hood to collect loose particles freed by the scraper, and a conduit is provided for removing the particles collected in the hood.—A. P.-C.

Doll-Head Bearing for Drying Cylinders. William P. Evans. U. S. pat. 1,795,546 (March 10, 1931).—In a doll-head bearing for the trunnion of a steam-heated cylinder, the closure member forming a steam-tight joint with the end of the shaft co-acts with a non-rotating diaphragm to the periphery of which the closure member is affixed. The diaphragm is anchored at its center to a central support independent of but affixed to the doll-head casting.—A. P.-C.

Drier Felt. Thomas Hindle. U. S. pat. 1,801,081 (April 14, 1931).—A multiple-layer felt comprises the combination of a dense intermediate layer of closely crowded interwoven and interlocked warp threads all of similar textile fibers and having a much greater number of ends per inch than the face layers and outer surface layers of close cellular porous structure having considerably fewer ends per inch than the intermediate layer.—A. P.-C.

Pulp and Paper Testing

American and British Pulp Testing Methods. H. W. Laymon. The Mead Corp., Chillicothe, Ohio. Technical Association Papers XIV, 254-257 (May 1931); Paper Trade J. 92, No. 26 43-46 (June 25, 1931).—Results are presented of comparative tests carried out on different grades of pulp by the British standard method and by the Mead method (Paper Trade J. 84, No. 8, 175 Feb. 24, 1927). From the data presented it would seem that both methods give good results and that results can be duplicated on separate portions of the same sample with a satisfactory degree of accuracy. The British method is about twice as slow as the Mead method; it was developed, however, with a view to precision, while the Mead method was developed essentially as a routine method of satisfactory accuracy. The advantages of the British method and the reasons militating for its adoption as standard by TAPPI and the Canadian Technical Section are brought out.—A. P.-C.

Progress Report on the Evaluation of Unbleached Pulps. Warren F. Moore and William R. Willets. Technical Association Papers XIV, 190-193 (May, 1931); Paper Trade J. 92, No. 18, 39-42 (April 30, 1931).—Testing data and curves are given on five unbleached sulphite and two kraft pulps tested by a modification of the TAPPI tentative beater method involving the use of mechanical, rather than manual disintegration, and a consistency of 1.75%, air-dry rather than 2.5%. As a result of this work, mechanical disintegration, a consistency of 1.75% air dry in the beater and longer time intervals (20 to 30 min. instead of 10 to 15 min.) for the removal of samples, especially for kraft, are recommended.—A. P.-C.

Evaluation of Wood Pulp. W. F. Moore and W. R. Willets. Technical Association Papers XIV, 289 (May, 1931); Paper Trade J. 92, No. 18, 45 (April 30, 1931).—The following major modifications are recommended in the proposed tentative standard beater method of TAPPI: (1) Use of mechanical instead of manual disintegration. (2) Use of consistency of approximately 1.75 per cent air dry, instead of 2.5 per cent. (3) Removal of samples from the beater at 20-minute intervals instead of 15-minute intervals for kraft pulp.—A. P.-C.

Development of Freeness Testers. Frederick C. Clark. Technical Association Papers XIV, 207-213 (May, 1931). Paper Trade J. 92, No. 23, 42-48 (June 4, 1931).—A review of the development of "freeness" or "slowness" testing devices (sometimes called beating testers), with a brief discussion of what they accomplished and their limitations.—A. P.-C.

Beating and Freeness Tester. Louis Schopper Laboratories. World's Paper Trade Rev. 95, 1630, 1632, 1673-1678 (May 8), 1714-1720 (May 15, 1931).—The construction and method of using the latest type of Schopper-Riegler freeness tester are described.—A. P.-C.

Comparison of the Canadian and British Methods of Preparing Test Sheets. W. E. Adlington. G. D. O. Jones, C. Alexander, and J. R. A. Legendre. Pulp Paper Mag. Can. 31, 766-767, 780, 782 (June 25, 1931).—Ten test sheets were made from unbeaten and beaten groundwood, bleached sulphite, kraft and bleached soda by the British method at the Price Bros. and Howard Smith Laboratories and by the British and Canadian methods at the Forest Products Laboratories, Montreal. The sheets were all tested for ream weight, Mullen burst, Elmendorf tear, Schopper tensile and Schopper fold at the Forest Products Laboratories. An analysis of the results showed that the English sheet machines agree amongst themselves and that there is no necessity for a conversion factor from the results obtained on one type of machine to those on the other.—A. P.-C.

Concerning the Swelling of Pulps. August Noll, Papier-Fabr, 29, No. 8, 114-116 (Feb. 22, 1931).—Description and illustration of an apparatus used at the Waldhof mills for the determination of the linear expansion and the degree of swelling of a pulp treated with 17.5% sodium hydroxide. The maximum linear expansion is reached in one minute. The thickness of the pulp discs is of

great importance in measuring the degree of swelling. In order to check results, great care must be given to each detail. Considerable data accompanies the article.—J. F. O.

Concerning the Determination of the Degree of Swelling of Pulps. L. Rys, Papier-Fabr. 29, No. 21, 325, (May 24, 1931).—The author claims that the method described by Noll was used by himself in 1925. His apparatus and method is described which is essentially the same. From the results of the linear expansion and degree of swelling a curve can be drawn showing the type of pulp and whether it is adaptable to its use.—J. F. O.

Pacific Coast Sulphite. G. J. Armbruster. Paper Mill 54, No. 24, 12-13, 26 (June 13, 1931).—A brief general discussion of the merits and qualities of sulphite made from Pacific Coast woods (western hemlock, white fir, silver fir and spruce).—A. P.-C.

Accurate Determination of Groundwood. F. Venneman. Mon. Papeterie Belge 10, 702-704 (Nov. 1930); Pulp Paper Mag. Can. 31, 634, 654 (May 21, 1931).—Various methods of determining the mechanical pulp content of groundwood-chemical pulp mixtures are discussed, and a volumetric method is described which gives results accurate to ±5%. A 4-g. sample is treated with potassium permanganate and the mechanical pulp content estimated from the potassium permanganate consumption with the aid of a prepared table for which, as well as for details of the method, the original should be consulted. A correction must naturally be applied for ash content if this is very high, and any dye present must be destroyed. The results agree well with those of the microscopic method, and the operation is much simpler.—A. P.-C.

Nomographic Freeness Correction Chart. D. S. Davis. Pulp Paper Mag. Can. 31, 586-587, 600 (May 7, 1931).—A nomographic chart for correlating temperature and consistency differences in determining the freeness of pulp is presented and explained.—A. P.-C.

Relations of Sheet Properties and Fiber Properties in Paper. I. A Qualitative Study of the Tensile Strength-Solid Fraction Relation. R. H. Doughty. Technical Association Papers 243-248 (May, 1931); Paper Trade J. 93, No. 2, 39-44 (July 9, 1931).—Results are presented in support of the hypothesis that the properties of sheets of paper and the properties of fibers making up the sheets of paper may be related through a knowledge of sheet structure. The data collected show especially the dependence of sheet strength on solid fraction, which is increased by wet pressing, and the changes in this relation caused by various processings of the pulp. The effects observed are explainable on the theory that the fibers are bound in the sheet by forces principally chemical in nature, and that beating results in an increased availability of these binding forces. In addition, it is suggested that besides an increased availibility there is also an increased efficiency of utilization of these bonds, resultng from the decrease in particle size on beating, and consequent greater shrinkage of sheets of beaten stuff on drying—A.P.-C.

Uniform Conditions for Paper Testing. M. D. Bardeen, Paper mill 54, No. 23, 18, 50 (June 16, 1931); Pulp Paper Mag. Can. 31, 790, 810 (July 2, 1931); Paper Trade J. 92, No. 24, 78 (June 11, 1931).—A brief discussion of the importance and effect of temperature and relative humidity on the results of physical tests of paper, particularly the finer grades, with a plea for the adoption of standard humidity and temperature conditions for paper specification tests.—A.P.-C.

Analytical Methods. Dirt in Paper. Anon. Paper Maker & Brit. Paper Trade J. 81, CXXXIX—CXLI (May 1, 1931).—A description of the method to be followed in examining paper for dirt and of the characteristic appearance and reactions of the chief spots likely to be encountered.—A.P.-C.

Measurement of Color Fastness. L. Blin Desbleds. World's Paper Trade Rev. 95, 1362-1368, 1409-1410 (April 17, 1931).—An explanation and discussion of the use of color-matching curves in the measurement of color fastness.—A.P.-C.

Permeability Test on Waterproof Boards. Ivan B. Privett. World's Paper Trade Rev. 95, 1436, 1438 (April 24, 1931).—An apparatus and method are described which permit of measuring accurately the time required to force a definite volume of air through a predetermined area of board under practically constant adjustable hydrostatic head.—A.P.-C.

Testing of Condenser Paper. F. L. Roman. Proc. A.M. Soc. Testing Materials 30, Pt. II, 1012-1024 (1930).—A discussion is given of the relationship between several characteristics of condenser paper made from linen stock and the dielectric strength (break-down voltage) of the condensers wound with this paper. Variations in the density of the condenser paper have no noticeable effect on the dielectric strength of the corresponding condensers. It is shown that, when in small numbers, conducting paths through the paper have no important effect on the dielectric strength of condensers wound with two sheets of the paper between tinfoils, but the percentage of "shorted" condensers or of condensers failing at very low voltages may be expected to increase approximately as the square of the number of conducting paths per unit area of the paper. Variations in the porosity of the paper are shown to have marked influence on the dielectric strength of the corresponding condensers and porosity requirements are suggested for papers used in low-voltage condensers and for papers used in high-voltage condensers.—A.P.-C.

Examining the Mechanical Technical Properties of Paper and Corrugated board with the Bursting Tester. G. Clemens, Papier-Fabr. 29 Nos. 7, 9, 10, 11, 12, 13, corresponding pages, 97-101, 129-135, 148-155, 167-171, 181-187, 198-203, Feb. 15 to March 29, 1931.—This exceedingly comprehensive article comprises 35 pages with 54 illustrations and 12 tables of data. In part 1 the author described the testing of smooth paper with the bursting tester, arriving at the following conclusions. 1. The sheet of paper under pressure in the bursting tester takes on the form of a sphere. 2. The stretch on the place under tension has no great influence on the results of the test. 3. The limited area of stretch at the point of rupture at the moment of the bursting causes a relative decrease in the bursting value because of the smaller test surface. 4. A test surface of at least 200 square centimeters must be used to obtain a more certain average value for the breaking load. 5. When one and the same paper is tested with various test surfaces, the results depends on the curvature of the sample of paper under the loading. 6. The test surface for carton is likewise made larger to avoid the influence of bending. 7. The increase in the calculated surface expansion with small test surfaces is a result of neglecting certain factors and has nothing to do with the behavior of the paper. 8. The calculation of the surface expansion gives more unreliable results with a poor paper than with a good paper. 9. The influence of the time on the test can not be determined, since the variations caused by this are covered up by the uniformity of the paper. The second part of this paper concerns the testing of the bursting strength of corrugated paper. 1. The corrugations must be pressed together before the test. 2. The joining of the corrugations or waves with the covering by means of strips utilizes to a greater degree the strength properties of the paper. 3. If the corrugated paper has less stretch than the covering, then the loading of the cover increases by hindering the expansion. 4. If the pressed corrugated board tested has a surface of 100 square centimeters or more, the deviations occurring can be used in judging the manufacture. 5. In testing of surfaces of 50 to 75 square centimeters there is the least degree of errors. The deviations then occurring are caused by the ununiformity of the paper. 6. For a good judgment of the board, consideration must also be given to the curvature and the working possibilities of the corrugated board.—J.F.O.

Color Specification in the Pulp and Paper Industry. W. B. Van Arsdel. J. Optical Soc. Am. 21, No. 6, 347-357 (June, 1931).—The author discusses the different methods and instruments

in use, including the Ives tint photometer and the Eastman and Pfund colorimeter. These methods show certain deficiencies. Conditions are outlined which must be possessed by a colorimetric method to fully satisfy the requirements of the pulp and paper industry.—C.J.W.

Schopper Dalen Bursting Strength Tester. Instruments 4, no. 7, 397-398 (July, 1931).—A special instrument has been designed for measuring the height of convexity formed by a sample of paper, cardboard, tissue or other kind of ductile material in sheet form before bursting in the Schopper bursting tester. The device consists of a contact point resting lightly on the center of the sample under test and is lifted when the same begins to bulge, this movement being transmitted on a measuring device and recorded by a pointer on a circulation graduation. From the bursting strength and the height of bulge the mean breaking load in kilograms relating to a strip one centimeter wide may be calculated.—C.J.W.

Machinery

Some New Principles in Valve Design. W. G. E. Smith. Pacific Pulp Paper Ind. 5, no. 5, 32 (1931).—Difficulties due to the lodging at stock in the guide slots in gate valves when pumping at high densities are obviated by a new type of gate valve. It comprises a body shell with side guides for a rectangular gate. There is no bottom guide slot, as the intake and discharge are relieved in such a manner as to make this unnecessary.—C.J.W.

Newer Methods of Tree-Stripping or Barking. Oskari Routala. Acta Chemica Fennica 3, 96-98 (1930); C. A. 25, 3829.—Knife barking gives a wood loss of 5 to 15 percent, while scraping drums and the Thorne scraper gives a 2 to 4 percent loss. A scraping drum 3.7 by 13.8 meters will bark 160 cubic meters per hour. Chemical methods, such as treatment with dilute alkali or warm dilute sulphuric acid or hydrochloric acid are used on wood too small for the scrapers. These solutions yield cellulose in yields of 55 to 56 percent. Shade trees stripped with dilute mineral acids give good yields of pentosans.—C.J.W.

Papermaker's Version of Proper Care of Rubber Covered Press Rolls. G. E. Emigh. Pacific Pulp Paper Ind. 5, No. 5, 28 (1931).—Directions for proper attention to rubber covered press rolls in Fourdrinier and cylinder machines by the mill hands are given in order to get long life and long runs between grinding. The writer claims that in most cases careless treatment and not the manufacturer should be made responsible for quick wear.—C.J.W.

Barking Pacific Coast Logs. W. H. Wharton. Pacific Pulp Paper Ind. 5, no. 6:27-29 (May, 1931.—A description is given of a Thorne log barker installed at the Port Alice mill of the British Columbia Pulp and Paper Co., Ltd. It is the first barker designed to handle whole logs up to 30 inches in diameter, with an average diameter of about 20 inches.—C.J.W.

Automatic Regulation of the Pressure of Digesters. Raymond Fournier. Papeterie 53, 511-512 (April 25, 1931).—A brief discussion of the advantages of hydraulic diaphragm valves over plain hydraulic valves for limiting the pressure in digesters.—A.P.-C.

Pulp Digester with Interior Circulation. Einar Morterud. U. S. pat. 1,802,266 (April 21, 1931).—A heating chamber comprising a tubular member is located along the inner wall of the digester near its central part and is secured to it by means of a tubular shank. A steam inlet pipe passes through the tubular shank to the interior of the heating chamber. A circulation pump is connected with one end of the heating chamber and an outlet sieve communicates with the other end of the chamber.—A.P.-C.

Fourdrinier Paper Machine. Samuel Milne. U. S. pat. 1,798,801 (March 31, 1931).—The breast-roll supporting means comprises a stationary side frame, to which is connected one end of vertical flat springs, the other end of the springs being secured to a vibratory frame carrying the breast roll. The springs have a rate of natural vibration which is not less than the rate of the required maximum vibration of the roll and wire. Means are provided on the end of the breast-roll trunnions to absorb the shock of the reversals.—A.P.-C.

Fourdrinier Machine for the Manufacture of Multiply Papers and Cardboards. Paul Erkens. U. S. pat. 1,799,092, (March 31, 1931).—A number of auxiliary endless wires are provided above the main fourdrinier wire, the auxiliary wires being shaken in synchronism with the main wire at the respective points where they contact with it.—A.P.-C.

Fourdrinier Wire Fabric. Guy M. Peterson assignor to Cheney Bigelow Wire Works. U. S. pat. 1,800,872, (April 14, 1931).—The weft wires and some of the warp wires are of relatively soft metal and the remaining warp wires are of relatively hard metal and of greater tensile strength than the others and interspersed at intervals in the body of the fabric among the warps of softer metal.—A.P.-C.

Metallic Cloth for Paper-Making Machines. Richard Kastner. U. S. pat. 1,794,624, (March 3, 1931).—A number of the weft wires are arranged side by side and in contact with each, being placed in the sheds formed by the warp wires.

Paper-Making Machine with Carrier Felt. Eugene M. Veyron assigner to Papeteries Navarre. U. S. pat. 1,798,821, (March 31, 1931).—In machines in which the paper is transferred from the wire to the press felt by means of a carrier felt, a suction cylinder is provided to act as a sheet-raising device. The cylinder is mounted on adjustable rocking arms, the oscillations of which are dampened in order to avoid crushing or wrinkling the sheet.—A.P.-C.

Paper-Winding Apparatus. John H. Reedy assignor to The here Champion Coated Paper Co. U. S. pat. 1,793,559, (Feb. 24, 1931).—The invention provides a smoothing roll for reeling webs of paper. The peripheral surface of the roll is provided with a number of V-shaped longitudinal grooves arranged in parallel spaced relation. The apexes of the grooves extend in the direction of motion of the surface of the roll. The bottoms of the grooves are perforated with a number of holes to permit the direct passage of air from the surface of the roll to the interior.—A.P.-C.

Calender Roll. .Theodor Greis. U. S. pat. 1,795,556, (March 10, 1931).—A calender roll comprises a core around which is wound a band or ribbon of material standing on edge and having its weft threads arranged in staggered relations.—A.P.-C.

Washing Kraft and Soda Pulp on Vacuum Washers. J. H. Noble. Paper Mill 54, No. 25, 14, 24-25 (June 20, 1931).—The advantages of vacuum filters over diffusers and pans for washing kraft and soda pulps are discussed. The method of washing kraft on vacuum filters is described, and figures are given on the performance of vacuum filters as primary and secondary washers.—A.P.-C.

Counter-Current Washing of Pulp. C. R. P. Cash. Paper Trade J. 92, No. 21, 41-42 (May 21, 1931).—Results are given of laboratory-scale experiments on the counter-current washing of kraft pulp on vacuum filters and showed that considerable steam savings could thus be effected. In commercial operation, considerable trouble would be encountered from foam, particularly in washing kraft produced from resinous woods.—A.P.-C.

Filters and Filtration. Reginald Trautschold. Paper Trade J. 92, No. 26, 29-34 (June 25, 1931).—A brief exposition of the principles involved in the continuous vacuum filter and of its many applications in modern mill practice.—A.P.-C.

Machine Wire Control. W. T. Armstrong. World's Paper Trade Rev. 95, 1538-1542, 1885-1596 (May 1, 1931); Paper Makers' Monthly J. 69, 201-209 (May 15, 1931).—After a brief description of the chief types of mechanical automatic wire guides and discussion of their ineffectiveness and drawbacks, the construction and operation of the automatic electrical wire guide developed by the author are described and its advantages pointed out.—A.P.-C.

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Business Stability Under Falling Price Level*

By J. W. Howell[1]

Any attempt to review recent economic changes reveals very clearly two fundamental problems American producers must solve before any degree of business stability can be assured. The first, is business recovery; the second, reorganization of industry in view of a probably falling price level.

The present depression *is the worst this country has seen both in extent and in intensity, and unlike the depression of 1921 does not offer the hope of immediate recovery either through new industries or markets.* Commodity price levels at home and abroad for several years have been steadily declining. Taking the 1926 averages for wholesale commodity prices as 100, the United States Bureau of Labor Statistics showed a decline to 93.4 for January, 1930, and during the last year we have witnessed a further decline bringing the price level down to 75 in March, 1931.

Even more disconcerting is the prediction of many of the leading economists, who have been studying monetary and banking problems, *that we are entering a long period of falling prices.* If this is true, we can expect shorter periods of prosperity and longer periods of depression during the next decade than we have had during the past.

The Cause of the Depression

Many theories have been advanced to explain the cause of the present depression—speculation, over-expansion of credit, over-production, declining markets, political insecurity—each, no doubt contributing to the present situation, but for any given industry perhaps the best explanation can be found in a careful survey of its industrial trend over the last two decades.

The enormous increase in the demand for goods and services created first, by the World War; and second, by rehabilitation of Europe after the war, produced a degree of industrial and agricultural expansion in the United States unparalleled in economic history. Production for world markets brought huge increases in plant capacity to meet this demand. For most industries it meant a larger number of producers as well as an increase in the size of the business unit.

But Europe, our largest customer, was buying on credit. In fact it was soon discovered that she had over-bought and our seeming prosperity of 1919 and 1920 ended in the depression of 1921. The recovery which followed depended in part upon the expansion of the automobile industry, and in part upon our recovery of the European market, but again on the basis of credit. As long as we were willing to accept promises to pay in the future in exchange for our goods, our export trade continued. By 1929 our ability to take foreign bonds was greatly reduced. In the meantime Europe returned to a gold standard and had gradually restored her industrial equipment destroyed during the war. Having a limited supply of dollars, and a huge debt, *Europe today is using most of her purchasing power to pay the interest.* Only what they have left after paying interest charges can be used in buying American products. But this is not enough to take care of our surplus and consequently we are in an unstable business condition.

In America much has been written about the growth of mass production in recent years. By mass production we mean the introduction of those processes by which greatly increased quantities of articles can be made at a very low cost, through the practical elimination of overhead expense per unit. Beginning in the automobile industry, mass production has rapidly been extended to our other lines of production. It is used today in the manufacture of most of the basic commodities, where the demand is national or international in character. This principle of production has even invaded European methods of production and today we find plants in England, France and Czechoslovakia producing under these scientific methods. At Bata, in Czechoslovakia, shoes produced under mass production methods are selling in all parts of the world.

Mass production in America received its impetus largely from the over-building of plant capacity during the World War. The phenomenal rise in prices during that period, expressing an abnormal demand for goods, led to enormous increases in plant capacity. The story in the cases of coal, copper, cotton, lead, oil, wheat, and zinc is substantially the same. But we were producing for a temporary, not a permanent, demand. *The prosperity of the post-war period was artificial,* not genuine in character. In the years that have followed, *America has had to face the problem of readjustment in view of an inevitable shrinking of demand.* The way out was mass production. Reduce cost by better methods of technique, greater ef-

* Address before Steel Founders Society, Pittsburgh, Pa., April 23, 1931.
[1] Asst. Professor of Economics, Carnegie Inst. of Technology, Pittsburgh,

ficiency of labor, and economics of large scale operation. The merger movement after the war testifies to these tendencies and is not unlike that of an earlier period—the 80's and the 90's—in American economic history. Through merger and the economies of mass production we were able to reduce cost and so, for a time, obscure the fact of over-expansion. Expansion of the home market, together with the foreign market, in view of lower prices, absorbed the supply of goods produced.

But in at least three industries, depression set in immediately after the war—agriculture, coal, and textiles. The last decade has been one of continuous depression for these industries. All the evils of depressed price, low wages, unemployment, and lowered margins of profit have appeared. *Price cutting, which is inevitable when over-supply exists, begins first by a reduction in cost due to drastic efforts on the part of producers to economize, but soon leads to inroads on the margin of profits as further economies are not forthcoming. It is only a question of time until profits are wiped out and losses set in.* Here and there an exceptional producer enjoys a profit, but for the industry as a whole, depression exists.

In contrast to agriculture, mining, and textiles, manufacturing industries in this country were prosperous. Price cutting existed, but never went beyond the economies gained through mass production. Falling prices which occurred were justified in view of reduced cost, manufacturers gaining through their ability to dispose of larger quantities. This ability, let me repeat again, was largely due to our foreign market. In 1929 our foreign market began to decline. Exporting industries in this country found their inventories increasing. As surpluses piled up, reductions in volume of production and employment became inevitable. Reduced purchasing power abroad soon led to reduced purchasing power at home, and consequently to the over-supply now present in most lines of production.

In manufacturing industries the tendency to decreasing cost is pronounced. Manufacturers always think of increased volume in terms of over-head—extra profits, because over-head will not increase proportionately with labor and material required. Restriction of supply, then, could mean only one thing—an increase in cost, and yet the marked decline in demand during the months which followed 1929 involved just this very thing, if over-production were to be avoided. *Failure to curtail production drastically during the first part of the depression intensified the situation.* Competition in recent months has become so keen that price cutting has reached a point where sales often are made at less than cost. According to the National Association of Manufacturers, more than 79 per cent of the members replying to a questionnaire on the relation of competition to prices state, that "price cutting is a major problem" in their industry today. The industries included were chemicals, textiles, lumber, brass, stone, clay and glass products, printing, food products, paper, iron and steel, leather and machinery. *Lower prices today no longer mean a wholesome tendency, the result of greater efficiency of industry, but rather, that industry is approaching a point where profit margins are tending to disappear.*

Price cutting below cost of production is something more fundamental than the work of a few greedy or ignorant producers; it is a symptom of overproduction—excess plant capacity. Where the tendency to decreasing costs is marked, many a producer has been forced through a chain of circumstances, which a depression creates, to continue a relatively high level of production even though the selling price is less than cost, in order to prevent a greater loss through idleness of plant. Whatever can be said in defense of such a policy from a short time point of view, and it usually assumes that depression will be short run in character, one thing is certain; *producers who cannot reduce output without excessive cost will be forced out of the game.* In the meantime all producers will suffer while readjustment is taking place. No one can review the record of lowered corporate earnings or the increasing number of bankruptcies during the past year without recognizing that *industry is undergoing a fundamental reorganization.*

Business Recovery

Turning now to the problem of business recovery, it is obvious *that no return to prosperity is possible without a substantial increase in the demand for goods and services, and renewed demand depends upon a recovery of foreign markets.* With land, labor, and capital organized for world trade, we must either improve the outside market or shift our economic activities to production for home markets. That this can be done no one will question. But it takes time. It will mean a long, slow process of readjustment. Agriculture can continue to contract, releasing thousands of workers now employed on farms for our overcrowded cities. We can curtail the production of automobiles, coal, copper, lead, oil, steel, and a host of other products, which are related either directly or indirectly with our export trade. Gradually capital will shift from industries where the rate of return is low, to industries where the future is brighter. No doubt in the course of time new lines of production will appear. This is nature's answer to the problem of maladjustment; ruthless competition is the force at work. *The business cycle operating through price is the regulator.*

But if we could recover our markets we could remove the necessity of this slow painful process. It raises anew the question, how can Europe's purchasing power be increased? Europe is suffering from a lack of markets, as we are. They have always excelled in the production of goods requiring a great deal of skill and hand labor. We, on the other hand, have excelled in machine-made goods. If Europe could sell to us, with her increased purchasing power, she would again become a market for our goods. But tariff barriers must be lowered. This factor, more perhaps than any other, is preventing an immediate recovery of business conditions. At a time when a reduction of tariff duties would have done much to keep up our markets, Congress raised them, and in the last few months we have watched nation after nation retaliate by similar tariffs against our goods.

Lower tariffs will come. It is merely a question of when. It will come because we have nothing to fear from such a policy. No nation possesses so many raw materials, power, resources, or specialized industries, together with an adequate system of transportation and communication. We stand in contrast to the nations of Europe in this respect. Italy is lacking in coal and iron; France has no copper; Germany has no cotton, leather or wool; England has little else but coal and iron. It is difficult to see how any of these nations could outstrip us industrially especially in view of our superior methods of mass production.

That this view is something more than the theorizing of the academically trained economist can be seen in the changing attitude of our leading bankers. As early as 1926 bankers joined in signing a manifesto calling for a removal of restrictions on European trade. Among the American bankers who signed this document were J. P. Morgan, Melvin A. Trayler, Albert H. Wiggin, J. J.

Mitchell, and Gates W. McGarrah. The keynote of the manifesto was as follows:

"There can be no recovery in Europe until politicians in all territories, old and new, realize that trade is not war, but a process of exchange; that in time of peace our neighbors are our customers, and that their prosperity is a condition of our own well-being. If we check their dealings, their power to pay their debts diminishes, and their power to purchase our goods is reduced. Restricted imports involve restricted exports, and no nation can afford to lose its export trade."

In March, the Chase National Bank of New York City issued a bulletin on the subject of "The Tariff and the World Depression," taking this same point of view. If we could restore our exporting industries to their former state, we would so greatly increase the demand for our manufactured products that few, if any, of our producers would have cause to complain over lowered tariffs. This seems to me to be the only immediate solution of our economic problems.

In the meantime, manufacturers must study their industry as never before. *The importance of thoroughly understanding the nature of the demand for their product, the character of their costs, cannot be emphasized too strongly.* A recent questionnaire of the National Association of Manufacturers revealed that at least fifty per cent of those who replied—and the very fact that they replied indicated that they represented the more progressive element—*do not know from month to month, or even year to year, whether they are actually manufacturing their products at the cost they assume to be correct. It may be commonplace to remind you that this is the first step, but until this is done, any attempt to study your market is a waste of time. Markets must be carefully reviewed in the light of present costs. In place of "volume" as a basis of sales policy, we must turn to price as being all important. Unless this change is taken we are facing a long period of price cutting in which prices will often be below cost, a period in which intelligent as well as ignorant producers will suffer.*

Falling Price Levels

Our second problem, falling price levels, is perhaps after all the more difficult of the two problems mentioned. Business cycles are temporary, not permanent in character, nor are they new to American business men. Today, however, there is a growing feeling among students of economic problems that the present depression marks another turning point in our economic history,—*we are definitely entering a long period of falling prices.* Long periods of price decline are not new in economic history; in fact every great war has brought just such a tendency. The economic changes which occurred during the Civil War and post-war periods culminated in the great depression of 1873, which, in turn, marked the beginning of a period of falling prices, lasting through the 80's and 90's. All of the evils which I have described today were present then as now, and it gave rise to the formation of pools, trusts, and combinations, so well known to students of American economic history. It was the business man's attempt to overcome the evils of price cutting under conditions of ruinous competition.

That period, however, was not without its brighter side. Our rapidly growing population absorbed much of the increased production. The 80's witnessed the construction of 74,000 miles of railroad, or 30 per cent of our present total mileage. Pig iron production increased 120 per cent, and soft coal 135 per cent. Unfortunately, this opportunity is not available in our present situation. There is no doubt but that population will continue to grow but at a much diminished rate. The home market will expand but very slowly, not so much through a need for more goods as through the creation of new wants, new uses for commodities that we are already producing.

Assuming that the monetary and banking problems, which today are playing so large a part in price changes, are overcome in the immediate future, and it is quite an assumption to make, we would still be faced with a mild price decline due to continued advance in technical improvement. Superior methods of production will conquer, mass production seems destined to become the world's method of securing goods and services. This decline, however, would be a wholesome one, indicating industrial progress. But to industry *it will mean constant readjustment of production schedules, more accurate cost data, and improved sales methods and policy.*

Suggested Remedies

It might be well at this point to offer a few suggestions that producers ought to consider in any attempt to overcome existing industrial ills. First, of course, is *trade education. There are very few industries today that do not have adequate organizations through which to carry out a campaign of education.* It has been estimated that there are between six and seven thousand trade associations in the United States. The Department of Commerce, in giving a list of the associations in January, 1929, referred to the phenomenal growth of these organizations in the following words: "Never before in the history of commerce has there been such willingness on the part of individuals and private organizations to unite in working for constructive upbuilding of our commerce and industry through greater efficiency of each group of related interests.

"The exchange of ideas and knowledge among competitors, which would have been considered commercial suicide or pure philanthropy at the beginning of the present century, is now considered mutually beneficial and constructive, a distinct contribution to higher business ethics, and a means of advancing daily the processes of production and distribution. Men are realizing that supplying the needs of the consumer is in essence a great cooperative effort." There is danger, however, that under the stress of hard times this willingness to cooperate may decline, *that membership in trade associations may decrease, and yet if ever there is a time when business needs the aid of united effort, it is in periods of depression and falling price levels. It is the only effective channel for accurate information about trade problems and the only effective means of trade education.*

Much has already been done in the fields of standardization and uniformity. There seems to be rather a need for more careful studies of the causes of price cutting and its relation to cost. *Education will do much to remove the ignorant price cutter from the field.* It will also reveal whether the problem calls for still further action.

Trade practice conferences as provided by the Federal Trade Commission offer another possibility. Under this method, representatives of the trade and representatives of the Federal Trade Commission meet to draw up rules of business conduct. A list of practices which the industry considers unfair is then submitted to the Commission for approval. The rules which are approved by the Commission are divided into two groups; practices which are considered unfair and hence illegal are placed in group one, practices on which the Commission expresses no opinion in group two. The problem, of course, has always been how to enforce the rules placed in the second group since

there is usually a minority in the industry who will not subscribe to them.

Trade practice conferences, however, have been very successful in eliminating some of the notoriously unfair methods of competition, and it generally is held that the agreements made in these conferences have been observed. It is well to remember that this method of approaching business problems is still in the experimental stage. In the decade which has passed we have had little need for such conferences. It is interesting to note that in a recent publication of the National Association of Manufacturers the importance of trade practice conferences is emphasized and attention called to the recent changes in the attitude of the Federal Trade Commission. Rules dealing with selling below cost, price discrimination, provision for price schedules, and rules aimed at rebates, allowances, dumping, leader lines, and free concessions were given group on approval. *In the matter of selling below cost, a rule is not likely to be approved unless a legally effective definition of cost can be obtained. The difficulty of defining cost is obvious, but there is no doubt that it is a step in the right direction.*

Responsibility Rests With Industry

If progress is slow, we must not forget that the *responsibility rests with industry to secure adequate cost data on which to base sound policies of procedure,* and the consumer must be protected against price invasion. There is always the danger that keen competition will be mistaken for unfair competition, that producers will fail to recognize the importance of internal economies, which often account for price differences.

Possibility of New Markets

Last, but not least, there is the possibility of new markets. In this age of substitution, new demands are constantly being created, new uses for old products. A country whose population is growing as in the United States can expect a slowly expanding domestic market for decades to come. Much more important, however, is the possibility of new markets abroad. While the recovery of the European market is essential for improvement of present business conditions, we must recognize that it is not a permanent market. As Europe adopts mass production methods our market will decline. This loss, however, can easily be overcome by securing new markets in those parts of the world still industrially undeveloped. South America, Africa, and the Far East are great sources of foreign trade and will no doubt become the world markets of tomorrow. It is in this direction that American producers must look if permanent outlets for our surplus are to be found.

Paper Production for August

[FROM OUR REGULAR CORRESPONDENT]

According to identical mill reports to the Statistical Department of the American Paper and Pulp Association from members and cooperating organizations, the daily average of the total paper production in August decreased 4 per cent under July and was 6 per cent under August, 1930. The daily average wood pulp production in August was 6 per cent below July, 1931, and 12 per cent under August, 1930.

Compared with August a year ago, the daily average production registered a decrease in the following grades: News print, uncoated book, paperboard, writing, hanging and building papers. Compared with July, 1931, the following percentage decreases were registered in the daily average production: News print, 11.2 per cent; paperboard, 4.8 per cent; bag, 1.1 per cent; and building, 10.1 per cent.

The eight months' cumulative total of production of paper was 9.9 per cent below the corresponding period in 1930 while shipments were 9.2 per cent smaller than a year ago. All the major grades of paper, excepting news print, have shown improvement in production at the end of the eight-month period as compared with the end of the seven-month period.

The eight months' cumulative total of wood pulp production for this year was reported as 17 per cent below the level of the same period in 1930.

Total shipments of wood pulp to the outside market were 31.7 per cent below the level of the eight months' total of 1930. Bleached sulphite and mitscherlich pulp shipments to the open market were greater than in the first eight months of 1930 while kraft pulp shipments registered no change from the 1930 level.

Total wood pulp inventories showed a continued decrease and at the end of August, were 25 per cent below the level of August 1930. All grades, excepting easy bleaching pulp, showed inventories below the level of August, 1930.

REPORT OF PAPER OPERATIONS IN IDENTICAL MILLS FOR THE MONTH OF AUGUST, 1931

Grade	Production tons	Shipments tons	Stocks on hand end of month tons
News print	88,344	89,047	32,607
Book, uncoated	70,224	68,771	48,269
Paperboard	153,523	154,392	58,695
Wrapping	45,537	44,469	43,901
Bag	11,934	12,797	5,133
Writing, etc.	21,109	21,961	46,926
Tissue	6,687	6,949	4,128
Hanging	3,261	2,337	3,029
Building	4,647	4,997	2,963
Other Grades	14,141	14,581	13,945
Total, All Grades, August, 1931	419,407	420,301	259,596
Total, All Grades, 8 Mos., 1931	3,518,720	3,519,452	259,596
Total, All Grades, 8 Mos., 1930	3,906,881	3,876,675	266,248

REPORT OF WOOD PULP OPERATIONS IN IDENTICAL MILLS FOR THE MONTH OF AUGUST, 1931

Grade	Production tons	Used during month tons	Shipped during month tons	Stocks on hand end of month tons
Ground wood	56,965	63,610	1,507	59,432
Sulphite news grade	26,386	25,243	797	6,470
Sulphite bleached	18,868	16,257	2,652	2,859
Sulphite easy bleaching	2,379	1,901	160	1,203
Sulphite Mitscherlich	2,716	2,595	702	1,325
Kraft pulp	26,987	22,949	4,610	4,228
Soda pulp	16,550	13,765	2,712	2,932
Pulp—Other grades	445	309	68	231
Total, All Grades, August, 1931	151,296	146,629	13,208	78,680
Total, All Grades, 8 Mos., 1931	1,371,011	1,244,501	117,102	78,680
Total, All Grades, 8 Mos., 1930	1,652,442	1,441,672	171,399	104,219

Import Paper Cases Accumulate

An accumulation of important cases involving efforts of importers to escape the payment of proper duties is reported in a letter from the Import Committee of the American Paper Industry to its subscribers. A total of eighty-four new cases is reported for the week, involving fancy, printing, book and many other grades of paper. Among the cases reported are the following:

Seven importations of lace paper, paper napkins, table cloths, etc., classified for duty at rates higher than those claimed by importers.

Paper classified as surface coated paper at 5 cents per pound and 15 per cent claimed by importer to be dutiable at 5 per cent as basic photographic paper.

Importation of creped kraft paper classified for duty at 6 cents per pound and 15 per cent, claimed dutiable as wrapping paper at 30 per cent.

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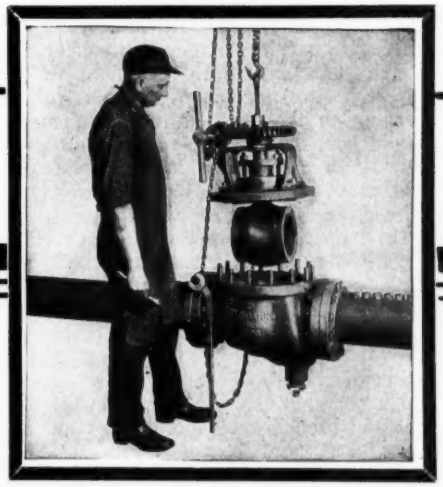

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Write for Bulletin V-103

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Monoplane Bond Meeting at Spring Grove

On Tuesday and Wednesday, October 6 and 7, the distributors of Monoplane Bond were entertained at Spring Grove by the P. H. Glatfelter Company at their first annual meeting. The program of the two days was given over to fifty per cent business and fifty per cent pleasure, amounting to 100 per cent profit.

Tuesday morning an educational trip was made through the Glatfelter mill and the manufacture of Monoplane Bond witnessed. A barbecue luncheon was then served at the Glatfelter home, each man being his own cook, and looking the part in aprons and caps. The party then split up, some making the very interesting tour of the Gettysburg Battlefield, and the others testing the difficulties of the Country Club of York golf course. In this the play of Walter Perry was outstanding, showing the lowest score of the afternoon—gross 93, net 73. A very delightful dinner was served at the Country Club, at which Charles H. Barr was the principal speaker.

Every one was thrilled with the late arrival of Oliver E. French, of Fred H. French Paper Company, Los Angeles, by plane, but it was later disclosed that instead of being Mr. French, it was Mr. Lippy, the magician, who was very pleasing in an exhibition of sleight of hand.

Wednesday morning was devoted to business, the policies of merchandising Monoplane Bond, and the advertising program for the ensuing year being determined and outlined. The afternoon was spent in a typical Pennsylvania Dutch manner. Everyone attended the York County Fair, spending a pleasant afternoon watching the horse races and viewing the many cattle exhibits. Mr. Glatfelter's Ayrshire cows were the outstanding entrants, one of his herd winning the Grand Championship of the fair, and the others receiving a big share of the prizes.

The following attended the Monoplane Bond meeting:

P. H. Glatfelter, W. S. McClellan, C. H. Stallman and W. L. Raymond, P. H. Glatfelter Company.

C. H. Barr, Printing and Paper Foundation, Holyoke.

B. W. Barton, Barton, Duer & Koch Paper Company, Baltimore.

C. W. Koch, Barton, Duer & Koch Paper Company, Washington.

J. Allan Donaldson and C. C. Hoffman, Donaldson Paper Company, Harrisburg.

C. H. Leissler, Conros Brothers, New York.

Wm. Steadman and Alfred Kinn, Jr., J. E. Linde Paper Company, New York.

Louis Schuman, Manhattan Card and Paper Company, New York.

Ed. Knauff and Allan Veit, A. W. Pohlman Paper Company, New York.

Walter E. Perry, Plymouth Paper Company, Inc., Holyoke.

Joseph H. Miller, Garrett-Buchanan Company, Philadelphia.

James L. Ham and A. Lawrence Ham, Arthur E. Ham & Sons, Boston.

W. D. Lamb, The Central Ohio Paper Company, Pittsburgh.

A. W. Redman, The Cleveland Paper Company, Cleveland.

Excellent Paper Box Co. Chartered

Excellent Paper Box Company has been chartered under the laws of New York State with a capital stock of $20,000. L. E. Greenberg, of 132 Nassau street, New York, was the attorney.

Import Committee Replies to Publishers

The Import Committee of the American Paper Industry has replied to the appeals of the American Newspaper Publishers Association before the Customs Service for a change in the so-called standard news print definition with a brief statement that the paper industry, as represented by the Import Committee, is willing to abide by the facts as to the chief use of paper as a basis for determining whether or not certain paper should be duty free as standard news print or dutiable as another grade. The publishers asked that the provision as to width of rolls be modified to allow free admission of 15-inch rolls, and that paper bulking 4½ points in thickness be classified as standard news print, with a tolerance of 1 per cent above this figure.

No formal brief has been filed by the Import Committee, but the following statement is made in reply to the request of the publishers for a modification of the definition:

"We submit that it was the perfectly plain and apparent intent of The Congress, as expressed in paragraph 1672 of the Tariff Act of 1922 and repeated in paragraph 1772 of the Tariff Act of 1930, that paper chiefly used in printing the regular and ordinary editions of newspapers should be entitled to free entry, and that all other printing paper should be dutiable. This Congressional intent has been aptly referred to by the Court in passing upon a somewhat similar question. Therefore, the burden is upon those who seek to procure the modification of the definition to produce facts which incontrovertibly show that the rulings of the Department are not sound in point of fact. Our position is and always has been that we will be bound entirely by what the facts disclose."

Tensilastic and What It Means

Everyone interested in rubber rolls, whether from the operating, maintenance or purchasing angle, will find much new and valuable information in a booklet just issued by the American Wringer Company, Woonsocket, R. I.

This booklet, entitled "Tensilastic and What It Means", tells in detail of recent developments in rubber compounding and fabrication particularly pertinent to its use in high speed, high pressure paper machine rolls. Tensilastic, according to the booklet, is an industrial rubber compound which has been developed scientifically in the laboratories of the American Wringer Company. Its formulae and processing methods are exclusively American Wringer Company possessions and the company claims that it is vastly superior in every way to any other rubber compound yet developed. It has the unique quality of being capable of the closest control at every stage of processing and can be duplicated in specifications of density and cure at any time. It cannot be overcured and is remarkably resistant to deterioration from oxidation, age and the action of chemicals.

The booklet tells in detail the history of Tensilastic development and its many advantages to paper mill operators. It is illustrated with graphs showing Tensilastic's superiority in tensile strength, ageing qualities and destiny control. While technical in subject matter, the booklet makes quick, easy reading and gives the layman much important information on the things to look for in the purchase of rubber rolls.

The care and preservation of rubber rolls are comprehensively covered in two other publications of the American Wringer Company, "Density and Care of Press Rolls" and "The Use and Abuse of Rubber Covered Rolls". Any or all of these booklets will be sent without charge by the American Wringer Company, Inc., Woonsocket, R. I.

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QUALITY SERVICE

New York Market Review

Office of the PAPER TRADE JOURNAL,
Wednesday, October 21, 1931.

Conditions in the local paper market are showing slight signs of improvement, mainly of a seasonal nature. Demand for the various standard grades of paper is slowly expanding and the closing months of the year should prove fairly lively from a trading standpoint. Sales forces of the leading paper houses are scouting for orders in a strenuous manner.

News print production is being maintained in sufficient volume to take care of current requirements. According to statistics gathered by the News Print Service Bureau, mills in North America operated at 61.8 per cent of rated capacity during September. The price situation continues unsatisfactory, despite efforts to stabilize the industry.

Trading in the paper board market is mostly along routine lines. Box board production in the East is being maintained at about 77 per cent of capacity. No radical changes were reported in the fine paper market. Some of the standard grades are in better demand. The coarse paper market continues irregular and kraft wrapping paper prices are easy.

Mechanical Pulp

Steadiness prevails in the ground wood market. Demand for both domestic and imported mechanical pulp is fairly persistent. Production at home and abroad has been practically keyed to consumption and accumulations are not excessive, it is reported. Prices remain unchanged and reports of concessions are infrequent.

Chemical Pulp

Further weaknesses developed in the chemical pulp market. Some slight price revisions were announced. No. 1 strong unbleached imported sulphite is now offered at from $1.75 to $2.15; while imported Mitcherlich unbleached is selling at from $1.80 to $2.10, all on dock, Atlantic ports. Other grades of foreign and domestic chemical pulp are practically unchanged.

Old Rope and Bagging

The old rope market continues listless. Demand for both domestic and imported old manila rope is light. Small mixed rope is also arousing little interest at present. The bagging market is spotty. Scrap bagging is in restricted request, while gunny bagging is moving very slowly. Prices on both old rope and bagging are nominal.

Rags

Quietness reigns in the domestic rag market. Paper mill demand for cotton cuttings is restricted. Roofing grades, however, are in fair request. Mixed rags continue quiet. The price situation is practically unchanged. The imported rag market continues unsettled but should become more active when foreign exchange is stabilized.

Waste Paper

The improvement experienced in the paper stock market of late is still in evidence. Board mill demand for the lower grades of waste paper is persistent and, with offerings limited, prices are steady to firm. The better grades of paper stock are fairly active. Book stock is going forward in satisfactory volume for the season. Prices are generally well maintained.

Twine

Although the local twine market is only moderately active at present, the volume of business transacted during the past week was well up to the average of the corresponding period of the preceding year, and the industry is considered in a sound statistical position. Prices are generally holding to previously quoted levels.

Standardization of Lithographic Papers

Miss R. M. Cobb, formerly chemist of the Lowe Paper Company, has been appointed research associate to the Bureau of Standards by the Lithographic Technical Foundation, to participate in the cooperative studies of these organizations relative to the standardization of lithographic papers. Miss Cobb has resumed the study of relation of paper and printing operations to misregister in the offset printing process, at the printing plant of the American Lithograph Company in Buffalo, N. Y. This study was initiated a year ago but was interrupted by lack of personnel. The reactions of various types of papers to the printing operations are being correlated with properties of the papers determined by tests in the bureau laboratory.

Simplified Practice on Glassine Bags

Simplified practice recommendation No. R107-31 covering glassine bags may be considered effective October 15, 1931, according to an announcement of the division of simplified practice of the National Bureau of Standards.

This action is prompted by the division's receipt of signed acceptances from a sufficient number of manufacturers, distributors, users and others interested to insure the general adoption of the program by the industry.

Uniform sizes for both flat and square bags for specific purposes, such as for packaging bread, pies and cakes, and sizes of general purpose bags of capacities from one ounce to two pounds, as used in the confectionery trade, are recommended in this simplification program.

Finnish Pulp and Paper Production

WASHINGTON, D. C., October 9, 1931.—Production of chemical pulp and paper in Finland during the second quarter of this year was under that of the corresponding three months of last year according to a report from Consul John L. Bouchal at Helsingfors.

The decline in the manufacture of chemical pulp resulted from the agreements among the principal producing countries to so restrict their output, and a further reduction of 15 per cent is to be expected.

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Serve every Felt Purpose in an efficient and satisfactory way.

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ENGLISH or BAKER WOVEN

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For 87 Years Makers of Fine Faced Felts

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Contract or Spot Delivery
In tank cars and multiple unit cars.
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(With or without perforations)

AUTOMATIC TUBE MACHINES
For Making Wire-Stitched Toilet Tubes

Sanitary Crepe Towel Machines, Roll Tighteners, Slitting and Rewinding Machines, Drop Roll Slitting Machines, Photo Mount Beveling Machines, Rotary Card Cutting Machines, etc.
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PULP AND PAPER

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Seamless felts for fast running.
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Special felts to meet every condition.
Send us your felt problems.

KNOX WOOLEN COMPANY
CAMDEN, MAINE

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BULKLEY, DUNTON & COMPANY
75-77 Duane St., N. Y., and direct

Miscellaneous Markets

Office of the PAPER TRADE JOURNAL,
Wednesday, October 21, 1931.

BLANC FIXE.—Demand for blanc fixe is moderately active. The contract movement is seasonal. Prices remain unchanged. The pulp is quoted at from $42.50 to $45.00 per ton, while the powder is selling at from 3¾ cents to 4½ cents per pound, in barrels, at works.

BLEACHING POWDER.—The bleaching powder market continues quiet. Contract shipments are moving in fairly satisfactory volume. Prices are holding to schedule. Bleaching powder is quoted at from $1.75 to $2.00 per 100 pounds, in drums, at works.

CASEIN.—The casein market is firmer. Domestic standard ground is now quoted at 7 cents and finely ground at 7½ cents per pound. Argentine standard ground is selling at 8½ cents and finely ground at 9½ cents per pound. These prices are for in bags, and are quoted for car lot quantities.

CAUSTIC SODA.—Steadiness prevails in the caustic soda market. Prices are holding to schedule. Solid caustic soda is quoted at from $2.50 to $2.55; while the flake and the ground are selling at from $2.90 to $2.95 per 100 pounds, in large drums, at works.

CHINA CLAY.—The position of the china clay market is practically unchanged. Contract shipments are fairly heavy. Imported china clay is quoted at from $13 to $21 per ton, ship side; domestic paper making clay is selling at from $7 to $11 per ton, at mine.

CHLORINE.—Conditions in the chlorine market are fairly satisfactory. The contract movement is normal for the time of year. Prices remain unaltered. Chlorine is quoted at $1.75 per 100 pounds, in tanks, or multi-unit cars, in ton lots, or over, at works.

ROSIN.—The rosin market is easier. The grades of gum rosin used in the paper mills are now quoted at from $3.85 to $3.90 per 280 pounds, in barrels, at works. Wood rosin is selling at $3.70 per 280 pounds, in barrels, on dock, car lot quantities.

SALT CAKE.—Trading in the salt cake market is moderately active. Prices are unchanged. Salt cake is quoted at from $16 to $17; chrome salt cake at from $14 to $15 per ton, in bulk, at works. Imported salt cake is selling at from $15 to $15.50 per ton. These quotations are for delivery at ship side.

SODA ASH.—The soda ash market is fairly steady. Supplies are moving into consumption in moderate volume. Prices remain unchanged. Quotations on soda ash, in car lots, at works, per 100 pounds, are as follows: in bulk, $1.00; in bags, $1.25; and in barrels, $1.38.

STARCH.—Most of the business transacted in the starch market during the past week was along routine lines. Prices are holding to schedule. Special paper making starch is quoted at $2.67, in bags; and at $2.94 per 100 pounds, in barrels, at works.

SULPHATE OF ALUMINA.—Paper mill demand for sulphate of alumina is fairly active. The contract movement is normal. Commercial grades are quoted at from $1.25 to $1.40; while iron free is selling at from $1.90 to $2.05 per 100 pounds, in barrels, at works.

SULPHUR.—The sulphur market is rather dull. Sulphur is quoted at $18 per long ton on orders of 1,000 tons, or over, on yearly contracts; and at $20 per ton for any smaller quantity over that period. On spot and near by car loads, the quotation is $21 per ton.

Market Quotations

Paper

(F. o. b. Mill)			
Ledgers	7.50	@	38.00
Bonds	6.00	@	53.25
Writings—			
Extra Superfine	14.00	@	32.00
Superfine	14.00	@	32.00
Tub sized	10.00	@	15.00
Engine sized	6.75	@	11.00
Book, Cased—			
S. & S. C.	5.25	@	—
M. F.	5.00	@	—
Coated and Enamel	6.75	@	10.25
Lithograph	7.25	@	11.75
Tissues—Per Ream—			
White No. 1	.65	@	.70
Anti-Tarnish M. G. only	.65	@	.70
Colored	.70	@	.90
White No. 2	.55	@	.60
Kraft	.65	@	.70
Manila	.55	@	.60
Manila—			
No. 1 Jute	9.00	@	9.25
No. 2 Jute	7.75	@	8.50
No. 1 Wood	4.00	@	5.25
No. 2 Wood	3.50	@	4.00
Butchers	3.37½	@	—
Fibre Papers—			
No. 1 Fibre	4.25	@	5.50
No. 2 Fibre	4.00	@	4.75
Common Bogus	1.50	@	3.00
Screenings	2.00	@	3.00
Card Middles	4.00	@	5.00
Glassine—			
Bleached, basis 25 lbs., No. 1	.09½	@	—
No. 2	.11½	@	—
Bleached, basis 20 lbs.	.11½	@	—
(Delivered New York)			
News, per ton—			
Rolls, contract	57.00	@	—
Rolls, spot	57.00	@	—
Sheets	62.00	@	—
Side Runs	42.00	@	46.00
Kraft—			
No. 1 Domestic	4.50	@	5.75
No. 2 Domestic	3.25	@	4.50
Southern	3.00	@	4.25
Imported	6.00	@	7.00
Boards—per ton—			
News	26.00	@	27.50
Straw	34.50	@	45.00
Chip	25.00	@	27.50
Binders' Boards	62.00	@	70.00
Standard 85 Test Liner	32.50	@	35.00
Sgl. Mla. Ll. Chip	37.50	@	42.50
(F. o. b. Mill)			
Wood Pulp Boards	70.00	@	80.00

Mechanical Pulp

(On Dock)

No. 1 Imported—			
Moist	24.00	@	26.00
Dry	25.00	@	26.50
(F. o. b. Mill)			
No. 1 Domestic	25.00	@	30.00

Chemical Pulp

(On Dock, Atlantic Ports)

Sulphite (Imported)—			
Bleached	2.40	@	3.50
Easy Bleaching	2.00	@	2.10
No. 1 strong unbleached	1.75	@	2.15
Mitscherlich unbleached	1.80	@	2.10
No. 2 strong unbleached	1.70	@	1.80
No. 1 Kraft	1.50	@	1.75
No. 2 Kraft	1.40	@	1.50
Sulphate—			
Bleached	2.75	@	3.25
(F. o. b. Pulp Mill)			
Sulphite (Domestic)—			
Bleached	2.25	@	4.50
Easy Bleaching	2.15	@	2.35
News	1.80	@	2.50
Mitscherlich	2.40	@	2.55
Kraft (Domestic)	1.60	@	2.75
(Delivered Paper Mills)			
Soda Bleached	2.75	@	—

Domestic Rags

New Rags

(Prices to Mill f. o. b. N. Y.)

Shirt Cuttings—			
New White, No. 1	6.50	@	7.00
New White, No. 2	5.50	@	6.00
Silesias No. 1	5.25	@	5.50
New Unbleached	7.00	@	7.50
New Blue Prints	4.00	@	4.50
New Soft Blacks	3.50	@	4.00
Blue Overall	5.00	@	5.25
Fancy	3.00	@	3.50
Washables	2.75	@	3.00
Mixed Khaki Cuttings	3.50	@	4.00
Pink Corset Cuttings	5.00	@	5.50
O. D. Khaki Cuttings	4.50	@	4.75
Men's Corduroy	3.00	@	3.50
New Mixed Blacks	3.00	@	3.25

Old Rags

White, No. 1—			
Repacked	5.25	@	5.75
Miscellaneous	4.25	@	4.75
White, No. 2—			
Repacked	3.00	@	3.50
Miscellaneous	2.30	@	2.50
St. Soiled, White	1.50	@	1.75
Thirds and Blues—			
Repacked	2.25	@	2.50
Miscellaneous	1.65	@	1.85
Black Stockings	3.25	@	3.75
Roofing Rags—			
Cloth Strippings	1.25	@	1.30
No. 1	1.25	@	1.30
No. 2	.90	@	1.00
No. 3	.70	@	.80
No. 4	.65	@	.70
No. 5A	.50	@	.60

Foreign Rags

New Rags

New Dark Cuttings	1.75	@	1.85
New Mixed Cuttings	2.00	@	2.20
New Light Silesias	4.50	@	4.75
Light Flannelettes	4.25	@	4.50
Unbleached Cuttings	6.00	@	6.25
New White Cuttings	5.25	@	5.50
New Light Oxfords	4.00	@	4.25
New Light Prints	3.00	@	3.25

Old Rags

No. 1 White Linens	6.00	@	6.25
No. 2 White Linens	5.00	@	5.25
No. 3 White Linens	3.50	@	4.00
No. 4 White Linens	2.00	@	2.50
No. 1 White Cotton	4.25	@	4.75
No. 2 White Cotton	3.25	@	3.50
No. 3 White Cotton	2.50	@	3.00
No. 4 White Cotton	1.45	@	1.60
Extra Light Prints	1.90	@	2.10
Ord. Light Prints	1.60	@	1.75
Med. Light Prints	1.40	@	1.55
Dutch Blue Cottons	1.50	@	1.60
French Blue Linens	2.25	@	2.40
German Blue Linens	2.00	@	2.10
German Blue Cottons	1.35	@	1.40
Checks and Blues	1.25	@	1.30
Lindsay Garments	.90	@	1.00
Dark Cottons	.70	@	.75
Old Shopperies	.65	@	.70
New Shopperies	.60	@	.65
French Blues	1.40	@	1.50

Old Rope and Bagging

(Prices to Mill f. o. b. N. Y.)

Gunny No. 1—			
Foreign	1.50	@	1.55
Domestic	1.60	@	1.65
Wool Tares, light	1.05	@	1.10
Wool Tares, heavy	1.10	@	1.15
Bright Bagging	1.05	@	1.10
Small Mixed Rope	.90	@	1.00
Manila Rope—			
Foreign	1.65	@	1.75
Domestic	1.75	@	1.90
New Burlap Cut	1.70	@	1.80
Hessian Jute Threads—			
Foreign	2.60	@	2.75
Domestic	2.80	@	3.00

Old Waste Papers

(F. o. b. New York)

Shavings—			
Hard, white, No. 1	2.65	@	2.85
Hard, white, No. 2	2.10	@	2.20
Soft, white, No. 1	2.10	@	2.20
White envelope cuttings	2.35	@	2.50
Flat Stock—			
Stitchless	.70	@	.80
Overissue Mag	.70	@	.80
Solid Flat Book	.60	@	.70
Crumpled No. 1	.48	@	.53
Solid Book Ledger	1.75	@	1.85
Ledger Stock	.65	@	.75
New B. B. Chips	.20	@	.30
Manila—			
New Env. Cut	1.75	@	1.85
New Cuttings	1.40	@	1.50
Extra No. 1 old	1.10	@	1.25
Print	.45	@	.50
Bogus Wrapper	.45	@	.50
Container	.30	@	.35
Old Kraft Machine—			
Compressed bales	1.20	@	1.30
News—			
No. 1 White News	1.60	@	1.65
Strictly Overissue	.35	@	.45
Strictly Folded	.35	@	.40
No. 1 Mixed Paper	.25	@	.30
Common Paper			Nominal

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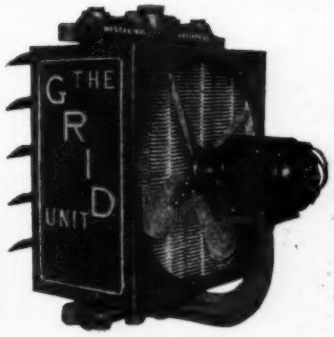

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GRID Units suspended in strategic locations solve the heating problem for Mills, Warehouses, Garages, etc., and do it at the lowest possible cost. Here is the most efficient type of unit heater. Built for high or low pressures, with sturdiest all-cast leak-proof, heating elements. Delivers the heat to the floor and working zone. No unions. No soldered or crimped joints; no flimsy tubes or fins. The Grid is built like a piece of machinery throughout! No future maintenance or up-keep costs.

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Division of D. J. Murray Mfg. Co.
Branches in Principal Cities Wausau, Wisconsin

Twines
(F. o. b. Mill)

Cotton—			
B. C., 18 basis	.30	@	.32
No. 1	.20	@	.22
No. 2	.19	@	.20
No. 3	.17	@	.18
A. Italian, 18 basis	.36	@	.37
Finished Jute—			
Dark, 18 basis	.18	@	.20
Light, 18 basis	.20	@	.22
Jute Wrapping, 3-6 Ply—			
No. 1	.13	@	—
No. 2	.11	@	—
Tube Rope—			
4-ply and larger	.09	@	—
Fine Tube Rope—			
4-ply	.11	@	—
3-ply	.12	@	—
2-ply	.13	@	—
Paper Makers Twine Balls	.07	@	—
Box Twine, 2-3 ply	.07	@	.08
Jute Rope	.09	@	.10
Amer. Hemp, 6	.27	@	.29
Java Sisal—			
No. 1 Basis	.10	@	—
No. 2 Basis	.09	@	—
New Zealand Sisal	.10	@	—
Sisal Lath Yarn—			
No. 1	.12	@	.14
No. 2	.10	@	.12
Manila Twine	.21	@	.22

CHICAGO

Paper
(F. o. b. Mill)

Rag Bond	.30	@	.53¼
Water Marked Sulphite Bond	.09	@	.12
Sulphite Bond	.06¼	@	.11
Superfine Writing	.18	@	.24
No. 1 Fine Writing	.14	@	.18
No. 2 Fine Writing	.12	@	.14
No. 3 Fine Writing	.08½	@	.12
No. 1 M. F. Book	.06½	@	.07¼
No. 2 M. F. Book	.05¼	@	.06¼
No. 1 S.&S.C. Book	.06¾	@	.07¾
No. 2 S.&S.C. Book	.05¾	@	.06½
Coated Book	.07½	@	.12
Coated Label	.07½	@	.10
No. 1 Manila	.04¼	@	.05¾
No. 1 Fibre	.04¾	@	.05¼
No. 2 Manila	.04¼	@	.04¾
Butcher's Manila	.04	@	.04½
No. 1 Kraft	5.00	@	5.50
Southern Kraft	3.75	@	4.00
No. 2 Kraft	3.75	@	4.00
Wood Tag Boards	.04¾	@	.06¼
Sulphite Screenings	.03	@	.03¾
Manila Tissue	.07	@	.07¾
White Tissue	.07¼	@	.07½
(Delivered Central Territory)			
News, per ton—			
Rolls, contract	57.00	@	—
Sheets	62.00	@	—
Boards, per ton—			
Plain Chip	30.00	@	35.00
Solid News	32.50	@	37.50
Manila Lined Chip	40.00	@	45.00
Container Lined—			
85 Test	50.00	@	55.00
100 Test	55.00	@	60.00

Old Papers
(F. o. b. Chicago)

Shavings—			
No. 1 Hard White	2.35	@	2.40
White Env. Cuttings	—	@	—
No. 1 Soft Shavings	2.10	@	2.15
Ledger & Writings	.70	@	.75
Solid Books	.75	@	.80
Blanks	1.60	@	1.65
Krafts	1.25	@	1.35
New Kraft Cuts	1.35	@	1.45
Manila Env. Cuts	1.50	@	1.55
Ex. No. 1 Manila	1.25	@	1.30
Print Manila	.40	@	.45
Overissue News	.40	@	.45
Old Newspapers—			
No. 1	.35	@	.40
No. 2	.30	@	.35
Mixed Papers—			
No. 1	.28	@	.30
No. 2	.20	@	.25
Roofing Stocks—			
No. 1	30.00	@	—
No. 2	28.00	@	—

PHILADELPHIA

Paper
(F. o. b. Mill)

Bonds	.05	@	.40
Ledgers	.07	@	.40
Writings—			
Superfine	.12	@	.18
Extra fine	.16	@	.22
Fine	.15	@	.26
Fine, No. 2	.12	@	.25
Fine, No. 3	.07	@	.20
Book, M. F.	.04½	@	.07
Book, S. S. & C.	.05	@	.07½
Book, Coated	.07	@	.16
Coated Lithograph	.06	@	.11
Label	.07	@	.11
No. 1 Jute Manila	.07	@	.09
Manila Sul., No. 1	.03½	@	.05½
Manila No. 2	.03	@	.04
No. 1 Kraft	.05¼	@	.06
No. 2 Kraft	.03¾	@	.04¼
Southern Kraft No. 1	—	@	.04
Southern Kraft No. 2	—	@	.03¾
Common Bogus	.03	@	.04
(Delivered Philadelphia)			
News Print Rolls	58.00	@	62.00
Straw Board	50.00	@	—
News Board	30.00	@	32.00
Chip Board	25.00	@	27.50
Wood Pulp Board	85.00	@	95.00
Binder Boards—			
No. 1, per ton	73.00	@	75.00
No. 2, per ton	63.00	@	65.00
Carload lots	62.00	@	67.00
Tarred Felts—			
Regular	52.25	@	54.25
Slaters (per roll)	.84	@	.94
Best Tarred, 1-ply (per roll)	1.95	@	2.10
Best Tarred, 2-ply (per roll)	1.50	@	1.60
Best Tarred, 3-ply	2.00	@	2.25
Khaki Cuttings—			
No. 1 O. D.	.04½	@	.05
No. 2 Mixed	.03½	@	.04
Corduroy	.02½	@	.03
New Canvas	.06½	@	.07
New Black Mixed	.03	@	.03½

Domestic Rags (New)
(Price to Mill, f. o. b. Phila.)

Shirt Cuttings—			
New White, No. 1	.06	@	.06½
New White, No. 2	.05	@	.05½
Light Silesias	.05	@	.05½
Silesias, No. 1	.06	@	.08
Black Silesias, soft	.05	@	—
New Unbleached	.06	@	.06½
Washable, No. 1	.02½	@	.03
Blue Overall	.05	@	.05½
Cottons—According to grades—			
Washable, No. 2	.02	@	.02½
New Blue	.02	@	.02½
Fancy	.03	@	.03¼
New Black Soft	.03	@	.03½
New Light Seconds	.01¾	@	.02
New Dark Seconds	1.85	@	2.00

Domestic Rags (Old)

White No. 1—			
Repacked	3.50	@	4.00
Miscellaneous	2.25	@	2.75
M. G.	4.50	@	—
Thirds and Blues—			
Miscellaneous	1.25	@	1.50
Repacked	1.75	@	2.00
Black Stockings (Export)	3.80	@	4.00
Roofing Stock—			
Foreign No. 1	1.15	@	1.25
Repacked	.80	@	.90

Bagging
(F. o. b. Phila.)

Gunny, No. 1—			
Foreign	1.50	@	1.60
Domestic	1.75	@	—
Manila Rope	2.25	@	2.50
Sisal Rope	1.25	@	1.50
Mixed Rope	1.10	@	1.25
Scrap Burlaps—			
No. 1	1.50	@	1.60
No. 2	1.10	@	1.20
Wool Tares, heavy	3.00	@	—
Mixed Strings	1.15	@	1.25
No. 1 New Light Burlap	2.50	@	2.75
New Burlap Cuttings	2.00	@	2.25

Old Papers
(F. o. b. Phila.)

Shavings—			
No. 1 Hard White	2.30	@	2.50
No. 2 Hard White	2.00	@	2.25
No. 1 Soft White	1.75	@	2.00
No. 2 Soft White	1.40	@	1.50
No. 1 Mixed	.75	@	.80
No. 2 Mixed	.50	@	.55
Solid Ledger Stock	1.35	@	1.40
Writing Paper	.80	@	1.00
No. 1 Books, heavy	.70	@	.75
No. 2 Books, light	Normal		
No. 1 New Manila	1.60	@	1.75
No. 1 Old Manila	1.25	@	1.30
Print Manila	.50	@	.55
Container Manila	.40	@	.45
Old Kraft	1.10	@	1.20
Common Paper	.30	@	.40
No. 1 Mixed Paper	.35	@	.45
Straw Board, Chip	.35	@	.45
Binders Board, Chip	.35	@	.45
Corrugated Board	.45	@	.50
Overissue News	.50	@	.55
Old Newspaper	.30	@	.35

BOSTON

Paper
(F. o. b. Mill)

Ledgers—			
Sulphite	.07½	@	.12½
Rag Content	.15	@	.30
All Rag	.38	@	.52½
Bonds—			
Sulphite	.06½	@	.11½
Rag content	.15	@	.30
All rag	.36½	@	.65
Writings	.06½	@	.20
Superfines	.11	@	.31
Book, Super	.0b	@	.09
Book, M. F.	.05½	@	.08½
Book, Coated	.08½	@	.18
Coated Litho	.09	@	.12
Label	.09½	@	.15
Jute Manila No. 1	.11	@	.13
Manila, Sul. No. 1	.04¾	@	.06½
Manila, Sul. No. 2	.03½	@	.04½
No. 1 Kraft	.04½	@	.05½
No. 2 Kraft	.03¼	@	.04
(F. o. b. Boston)			
Southern Kraft	.03¼	@	.04
(F. o. b. destination in carload lots, f. o. b. mill in less than carload lots.)			
Common Bogus	.02	@	.02¾
(Delivered New England points)			
News Print, rolls	—	@	56.50
Straw Board, rolls	.009	@	52.50
Straw Board in Sheets, basis 35s to 70s	—	@	50.00
Filled News Board	27.50	@	30.00
Chip Board	27.50	@	—
Chip Board (Creasing)	27.50	@	30.00
Single Manila Lined Chip	40.00	@	45.00
Single White, Patent Coated News Board—Binder	52.50	@	60.00
Wood Pulp Board	70.00	@	75.00
Binder Boards	67.50	@	75.00

Old Papers
(F. o. b. Boston)

Shavings—			
No. 1 Hard White	2.75	@	3.50
No. 2 Hard White	2.25	@	2.50
No. 1 Soft White	1.90	@	2.10
No. 2 Mixed	.60	@	.65
No. 1 Mixed	.90	@	1.00
Solid Ledger Books	1.75	@	2.00
Overissue Ledger Stock	1.35	@	1.60
Mixed Ledgers	1.15	@	1.30
No. 1 Books, heavy	.65	@	.75
No. 1 Books, light	—	@	.45
Crumpled Stitchless Book Stock	1.00	@	1.25
Manila Env. Cuttings	1.85	@	2.00
No. 1 Old Manila	—	@	1.00
White Blank News	1.50	@	1.60
Kraft No. 1	1.00	@	1.15
Manila	.90	@	1.00
No. 1 Mixed Paper	.25	@	.35
Print Manila	.40	@	.45
Overissue News	.40	@	.45
Old Newspapers	.32½	@	.40
Box Board, Chip	.20	@	.25
Corrugated Boxes	.37½	@	.47½

Bagging
(F. o. b. Boston)

Gunny No. 1—			
Foreign	1.55	@	—
Domestic	1.50	@	—
Manila Rope—			
Foreign	1.50	@	1.75
Domestic	1.75	@	2.00
Transmission Rope	1.25	@	1.40
Mixed String	.50	@	.55
Jute Rope	1.00	@	1.15
Jute Carpet Threads	.75	@	.90
Bleachery Burlap	2.50	@	2.75
No. 1 Scrap Burlap	1.10	@	1.25
Scrap Sisal	1.35	@	1.45
Scrap Sisal for shredding	1.50	@	1.60
Wool Tares, heavy	1.25	@	1.30
New Burlap Cutting	1.50	@	1.25
Australian Pouches	2.00	@	2.25
Heavy Baling Bagging	1.50	@	1.60
Paper Mill Bagging	.90	@	1.05
Bagging No. 2	.50	@	—
No. 1 Burlap	—	@	3.50

Domestic Rags (New)
(F. o. b. Boston)

Shirt Cuttings—			
New White No. 1	.06½	@	.07
New White No. 2	—	@	.06
Silesias No. 1	.06	@	.06¼
New Black Silesias	.02¼	@	.02¾
New Unbleached	—	@	.08
Fancy	.04	@	.04½
Washable	.04	@	.04½
Cottons—According to grades—			
Blue Overalls	.05	@	.06
New Black, soft	.04	@	.04¼
Khaki Cuttings	.04	@	.04½
O. D. Khaki	.04½	@	.05
Corduroy	.03	@	.03½
New Canvas	.08	@	.08½

Domestic Rags (Old)
(F. o. b. Boston)

Canvas	.04½	@	—
White No. 1—			
Repacked	4.75	@	5.25
Miscellaneous	—	@	4.00
White No. 2—			
Repacked	.04½	@	.05
Miscellaneous	.03½	@	.04
Twos and Blues	2.50	@	2.75
Thirds and Blues—			
Repacked	1.60	@	1.80
Miscellaneous	1.00	@	1.20
Black Stockings	3.25	@	3.50
Roofing Stock—			
No. 1	—	@	.65
No. 2	—	@	.58
No. 3	—	@	.53

Foreign Rags
(F. o. b. Boston)

Dark Cottons	—	@	.70
New No. 1 White Shirt Cuttings	6.50	@	6.75
Dutch Blues	—	@	1.80
New Checks & Blues	4.00	@	4.50
Old Fustians	1.55	@	1.65
Old Linsey Garments	.80	@	.90

TORONTO

Paper
(F. o. b. Mill)

Bond—			
No. 1 Sulphite	.10¾	@	—
No. 2 Sulphite	.08½	@	—
No. 1 Colored	.11¼	@	—
No. 2 Colored	.09	@	.10½
Ledgers (sulphite)	—	@	—
Ledgers, No. 1	.36	@	—
Ledgers, No. 2	.27	@	—
Writing	.09½	@	.10
Book—			
No. 1 M. F. (carloads)	6.65	@	—
No. 3 M. F. (carloads)	6.20	@	—
No. 1 S. C. (carloads)	7.15	@	—
No. 3 S. C. (carloads)	6.65	@	—
No. 4 S. C. (carloads)	5.70	@	—
No. 1 Coated and Litho	12.50	@	—
No. 2 Coated and Litho	11.50	@	—
No. 3 Coated and Litho	10.00	@	11.50
Coated tinted	14.00	@	—
Wrapping—			
Rag Brown	4.95	@	—
White Wrap	5.25	@	—
"B" Manila	5.00	@	—
No. 1 Manila	5.40	@	—
Fiber	5.40	@	—
Kraft, M. F.	5.90	@	—
Kraft No. 2	5.40	@	—
(Delivered Toronto)			
News, per ton—			
Rolls (contract)	56.50	@	57.00
Sheets	61.50	@	—

Pulp
(F. o. b. Mill)

Ground Wood	30.00	@	32.00
Sulphite easy bleaching	50.00	@	—
Sulphite, news grade	44.00	@	—
Sulphite, bleached	62.50	@	75.00
Sulphate	60.00	@	—

Old Waste Paper
(In carload lots, f. o. b. Toronto)

Shavings—			
White Env. Cut	2.80	@	—
Soft White	2.60	@	—
White Blk. News	1.50	@	—
Book and Ledger—			
Flat Magazine and Book Stock (old)	1.10	@	—
Light and Crumpled Book Stock	1.20	@	—
Ledgers and Writings	—	@	—
Manilas—			
New Manila Cut	1.50	@	—
Printed Manilas	.80	@	—
Kraft	1.90	@	—
News and Scrap—			
Strictly Overissue	.70	@	—
Strictly Folded	.70	@	—
No. 1 Mixed Paper	.60	@	—

Domestic Rags
(Price to mills, f. o. b. Toronto)

No. 1 White Shirt Cuttings	.09½	@	.10
Fancy Shirt Cuttings	.06	@	.06¼

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